

Asset Owner Governance and Fiduciary Effectiveness: The Case of Public Pension Plans

Christopher Kinne Merker
Marquette University

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**ASSET OWNER GOVERNANCE AND FIDUCIARY EFFECTIVENESS:
THE CASE OF PUBLIC PENSION PLANS**

by

Christopher K. Merker, B.A., M.B.A., CFA

**A Dissertation Submitted to the Faculty of the Graduate School,
Marquette University, in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy**

Milwaukee, Wisconsin

May 2017

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DISCLAIMER

The author is an employee of the investment firm, Robert W. Baird & Co., where he works in the capacity of an investment consultant. The views shared in this dissertation are those of the author's, and do not represent those of the organization.

ABSTRACT

ASSET OWNER GOVERNANCE AND FIDUCIARY EFFECTIVENESS: THE CASE OF PUBLIC PENSION PLANS

By Christopher K. Merker, CFA

Marquette University, 2017

Purpose: The U.S. and many developed countries are currently facing a retirement savings crisis. The governance of institutional funds, such as public pension plans, is coming under greater scrutiny in light of systematic chronic underfunding, declining investment returns and shifts into higher risk asset classes. A disconnect exists between an organization's process under the standards, and the outcome of this process, the overall effectiveness of the organization and, in particular, its investment performance and funding status.

Methodology: In 2012, there were approximately 6,300 public retirement systems in the United States with over \$3 trillion in assets. We collected financial, governance and legal data for the study period 2008-2012. Using the data reduction technique, Principal Components Analysis, we successfully constructed a Fiduciary Effectiveness Quotient Index (FEQ) and Legal Index, and applied these indexes to multivariate regression analyses to understand impacts on investment returns, funding ratios and bond yield spreads.

Findings: The FEQ and legal variables demonstrated robust statistical relationships to pension plan performance measures. Top quintile FEQ organizations outperform bottom quintile FEQ organizations nearly 2 to 1 based on investment return performance. Higher FEQ organizations have 27% lower interest cost on related municipal bonds. The FEQ and the Legal Index together have a direct impact on the funding ratio of pension plans, which explain 89% of the variation in the funding ratio, an important measure of pension plan financial health. The FEQ, Legal Index and other factors were 93% accurate in distinguishing effective from ineffective plans, defined as plans having a funding ratio above or below 0.50.

Conclusion: While this topic has increasingly gathered attention over the last 20 years, many studies have overly relied on survey responses to discern conclusions around best practices (Spence Johnson, State Street), a method without empirical basis. This study reveals that the structure, process and engagement of boards are critical to sustaining effective performance. Best practices are reviewed and recommended.

Recommendations: Cross-country extension of this empirical approach into the examination of other asset owners including private pensions, foundations, endowments and trusts is recommended to assist trustees and policy makers.

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To Dr. Sarah Peck, my lead advisor, governance expert, and colleague for the past seven years, and my partner every step of the way through this project, I owe a huge debt of gratitude. Without your knowledge, experience, tutelage, resources, etc. this project would never have gotten out of the gate, let alone crossed the finish line.

To Nadelle Grossman, my law school instructor, committee member, and constant supporter from the legal side, without you several important aspects of this study would never have come to fruition. To the legal research assistants, Christopher “Chal” Little and Jill Demski, your technical knowledge was critical to identifying the right legal data to collect.

To the GAs in the Finance Department, Tom Long and Chris Bango, who had the thankless task of combing through hundreds of pages of meeting minutes documents, were it not for you there would be no outcome on this project. I am thankful for your diligence and accuracy.

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Management (AIM) program at Marquette, if I could point to one place where the ideas for this dissertation germinated it was in the AIM room. Our ongoing study and discussion of the industry, and exchange of ideas around ethics, governance and the investment profession every spring has been endlessly rewarding. There is nothing like a university setting for finding new ways to look at the world.

I want to also thank my close friends and sparring partners, Steve Vanourny, Tom Anderson, Nathan Swanson, Rob Schlesinger, Dave Honan and Tony Baish for your ideas, ongoing debates, career inspirations, networks, and long-term friendship. For several of us, we were fortunate to find a passion for lifelong learning instilled in us early in life, and interesting careers thereafter through the inspiration of one Dr. Francis McMann, who studied under Milton Friedman at the University of Chicago, and who, despite being a committed *laissez fairest*, chose a public high school setting in Iowa for his vocation. Generations of students like me were set on an enriching path and many have made contributions certainly far greater than myself to society in untold and countless ways.

And to my parents, Tim...my father who originally taught me about the markets, and my mother, Marny, who taught me consideration of others, and to – above all – believe in myself.

To my friends and colleagues at the CFA Institute, Paul Smith, CFA, Bob Stammers, CFA, Rebecca Fender, CFA and Dr. Michael McMillan, CFA to name but a few, and the board and members of CFA Society Milwaukee, your ongoing mission to raise standards for the industry and the profession has been an endless source of ideas and inspiration for me. To Brenda Campbell, and the people at Make-A-Difference-WI, your dedication to basic financial literacy is changing the world as we know it. Never stop!

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Wauwatosa, Wisconsin
August 28, 2016

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PREFACE

Fran Chanwick and Laura Wendling in a 2006 article that appeared in *Social Studies Review* praised interdisciplinary approaches in the social sciences:¹

Social studies is inherently interdisciplinary. Within the field, the various disciplines that comprise social studies link and intertwine. It's difficult to imagine studying historical content without examining the roles of persons (sociology), their motivations (psychology), where they lived (geography), the influences of spiritual beliefs (religion), rules that govern behavior (political science and anthropology), or how people negotiate for their needs and wants (economics). Outside the field of social studies, vital connections can also be made to language arts, mathematics, science and the arts that yield a deeper understanding of concepts and ideas.

Confronting a topic such as governance in investment management, especially in the area of retirement security, is one subject that requires a thorough knowledge crossing multiple disciplines. Consider the approach taken in recent years by one high profile organization: The Bipartisan Policy Center, recognizing the crisis facing millions of American workers, formed a Commission on Retirement Security and Personal Savings in 2014 to address the challenges facing many current and future retirees.² The people on that 19-member commission came from many different backgrounds and disciplines including government, economics, industry, unions and think tanks. A complex issue demands intricate examination through multiple lenses.

Since Graham and Dodd, who wrote in the early 1930s, the field of finance has primarily focused on understanding the valuation and movement of asset prices. Since the 1970s, this began to change with the work of psychologists like Daniel Kahneman and Amos

¹ Chadwick, Fran and Wendling, Laura M., "Social Studies: An Interdisciplinary Approach", *Social Studies Review*, Vol. 45. No. 2, Spring 2006

² "Securing Our Financial Future: Report of the Commission on Retirement Security and Personal Savings", June 2016, Bipartisan Policy Center

Tversky, who introduced the idea that perhaps humans are bounded in their own rationality, and that common behavioral biases can manifest themselves every day in product and financial markets in ways that can be explained by alternative theories beyond classical economics.

Such is the approach I have taken in this work. Drawing from economics, law, psychology, finance and ethics, I have cast a wide net in trying to understand whether we can assess and systematically understand the governance of asset owners, including pension funds, foundations, endowment and trusts. For example, it is nearly impossible to talk about a fiduciary without reference to the law, discuss investment objectives without considering financial concepts, or examine a board decision without considering the organizational behavior aspects underpinning a given board's interaction.

The idea for this study came to me from two different – but connected – worlds: from several years of working directly with asset owners and other investors; and teaching the subject of investment ethics, corporate governance and socially responsible investing at Marquette. I observed “on the ground” the challenges that organizations regularly face in doing the best job they can with their investments, how organizations can go through up and down periods, and I also saw the impact our work was having in helping organizations to do better. And “in the sky”, I became a student of corporate governance in my own classroom, including regularly bringing in outside experts in this area with real world experience serving on boards. This includes people like John Shiely, chairman emeritus at Briggs & Stratton, and a professional board member and student himself of corporate governance having done fellowship work at Harvard on the topic (and also a grad of the Marquette Law School). When I was an MBA student in the late 1990s, corporate governance was in the early stages of becoming a classroom topic; and now it is an integral part of finance and law school curricula.

I also feel quite fortunate to have fallen in with – and be influenced by – many wonderful, talented and thoughtful people at Baird, Marquette, the CFA Institute and the CFA Society Milwaukee and Make-A-Difference-WI, many of whom have dedicated their lives to making the world a better place, whether for investors or for students-in-training to serve investors. And I'm glad I have had the opportunity to make this modest contribution to the field. For this reason, I dedicate this work to the people who work every day to confront the ills of financial illiteracy.

CHAPTER I
INTRODUCTION

The word 'risk' derives from the early Italian risicare, which means 'to dare'. In this sense, risk is a choice rather than a fate. The actions we dare to take, which depend on how free we are to make choices, are what the story of risk is all about. And that story helps define what it means to be a human being.

– **Peter L. Bernstein, Against the Gods: The Remarkable Story of Risk**

Human history could be summarized as a struggle to minimize risk to one's livelihood and live as comfortable a life as possible for as long as possible. In many respects in today's world we can declare victory on this goal. People are living more comfortable lives longer, and this quality of life is not limited to the select few, but for many living well above the poverty line. Happiness, or social well-being as an increasingly popular measure of human welfare, is also widespread and continuing to grow.³ And for those still living at or below the poverty line, there is still hope as countries continue their forward progression of growth and development.

And yet despite this progress, we are facing a looming crisis of epic proportion: a risky and insecure retirement for millions of Americans. To see the many commercials on television about retirement planning, one would come away with the impression that the solution is already in place. The statistics tell a much different story. The average household has virtually no retirement savings. 45% of working households do not have an IRA or a 401(k) account. The estimated collective savings gap for working households ages 25 to 64 is estimated to be between \$6.8 and \$14 trillion. Two-thirds of working households ages 55

³ See Michael Porter's Social Progress Index (SPI) for example.

to 64 have not saved more than one year's worth of salary, and 90% of all working households fail tests of retirement and pension assets for meeting future retirement needs.⁴

An under-saved population, and an underfunded "safety" net system – in the face of rising longevity, increasing health care costs, and unfavorable demographic trends (i.e., more retirees and fewer workers due to lower fertility rates across the entire developed world) – portend a future of financial, political and social instability. This poses a large-scale problem that is certain to come to a head this century, and we are already seeing the cracks in places like Chicago, where the local government is already in the throes of dealing with its pension crisis.⁵

Transition to the Welfare State

Making sure that aging workers have their basic needs met in retirement until death has been a common social value and objective since the beginning of civilization. Throughout human history most elders were adequately cared for under the extended family model (Aboderin, 2004).

Yet, for most of human history provision for a long retirement was largely unnecessary as most died earlier in life anyway. That condition has changed: life expectancy since 1850 has nearly doubled, increasing by approximately 40 years.⁶ Today a large percentage of people may expect to live 25 or 30 years into retirement.

The extended family model started to break down during the course of the Industrial Revolution, as humans migrated on a massive scale from rural to urban areas in

⁴ "The Retirement Crisis: Is it Worse than We Think?", by Nari Rhee, Ph.D., National Institute on Retirement Security, June 2013

⁵ The Pension Crisis in Chicago and Illinois website, *Chicago Tribune*
<http://www.chicagotribune.com/news/watchdog/rtc/chi-pension-crisis-gallery-storygallery.html>

⁶ University of Oregon, <http://mappinghistory.uoregon.edu/english/US/US39-01.html>

search of work and a new life. Heretofore, there was no need for state- or firm-provided retirement plans, as the extended family more or less provided for those needs.

In the 20th century, two trends emerged: the nuclear family as the primary household unit, with no longer multiple generations living under one roof, and as mentioned already, longer lives. In addition, divorce became more prevalent as women gained more social and economic independence. With divorce impacting one out of two families, the family unit has been further eroded, with few able or willing to care for the grandparents and great-grandparents during their golden years (ibid).

The rise of the Welfare State is one significant shift that occurred over the course of the 20th century to fill this gap. As labor movements arose in the late 19th century, corporations began introducing health and retirement plans. Public plans at the state and municipal levels were introduced as well. During the Great Depression of the 1930s, these local level schemes were broadened to cover virtually every American with the introduction of Social Security, Medicare and Medicaid (Ferguson, 2008).

Capitalism

Both the private and public sectors have a multi-fold role in this system of retirement security. This can in no way be characterized as an offshoot of a purely capitalist model, but rather a hybrid state capitalist system that emerged to buttress the social upheaval wrought by the 19th century Industrial Revolution (ibid).

First, workers and employers pay into health and retirement schemes, whether through pre-tax contributions or through payroll tax. Secondly, particularly in public and private pension schemes, the pooled contributions of employers and employees are

invested in the capital markets. Early on these investments were made in primarily conservative fixed income investments, but over time especially through the spread of Modern Portfolio Theory beginning in the 1950's, they became diversified across equities and alternative investments (e.g., investments in non-traditional asset classes including commodities, real estate, private equity and hedge funds), and so the investable universe expanded. The base of pooled savings and investment – and the industry around it – grew. Provision to the generation of retirees at the time was a non-issue in the face of a rapidly growing U.S. economy and high worker-to-retiree ratios to fund a mostly “pay-as-you go” system, using Social Security as an example.⁷

Pools of assets such as retirement funds are managed for the purpose of growing the capital base, as well as to produce income. Both capital appreciation and investment income are forms of investment return. The targeted rate of investment return is intended to: 1) maintain purchasing power by keeping pace with inflation, and; 2) minimize and close the gap on future funding requirements to meet benefit payments throughout the course of beneficiary retirement.

Until the 1980s private sector retirement plans were primarily comprised of Defined Benefit (DB) plans, which are plans that provide a guaranteed benefit to the future retiree. Since that time, various schemes known as Defined Contribution (DC) programs, primarily 401(k) and 403(b) plans, have predominantly shifted the future funding burden from the employer to employee, and such has been the trend with the decline in DB programs (Broadbent et al, 2006). Since 1985 the percentage share of DB versus DC plan assets in the U.S. has flipped with the majority of assets in Defined Contribution plans today (ibid).

⁷ Feldstein, Martin and Liebman, Jeffrey B., *Handbook of Public Economics, Volume 4*, Chapter 32, Social Security pp.2248-2265, edited by A.J. Auerbach and M. Feldstein © 2002 Elsevier Science B.V.

This shifting of the funding burden on employees has at the same time called on them to be more directly involved in investment decisions. Employees must decide not only how much to save for retirement, but then how to invest those savings in the capital markets. This approach leaves employees up to their own devices with many ill-prepared to make such decisions (Benartzi and Thaler, 2007). This leads to sub-optimal investment returns in aggregate across society, and fails the utilitarian test for good public policy of benefiting the most for the least cost, but it does transfer the risk of not meeting benefit obligations from employer to employee.

Capitalism does play a significant role in providing the incentives for service providers and investment products to help institutions and individuals invest for retirement. The range – and quality – of service providers vary significantly, from investment consultants to investment managers to financial advisors, in addition to the army of custodians, trustees, retirement plan attorneys who specialize in ERISA, and actuaries and third party administrators that provide plan services.⁸

The investment products abound as well, from target date funds, which are dynamic asset allocation mutual funds that automatically “risk adjust” as the mutual fund holder approaches retirement, to annuities, which are insurance contracts that offer a guaranteed income stream over a period of years in retirement. The overwhelming number of savings and investment vehicles further burdens individuals in making both informed and effective decisions. Sub-optimal outcomes are impacted by the inability of many individuals to contend with numerous issues such as fees and expenses, investment performance and tax implications to name but a few. It also leaves individuals vulnerable to sales people,

⁸ Employee Retirement Income Security Act of 1972 (ERISA)

especially purveyors of hybrid investment and insurance products, such as annuities, which promise guaranteed income, but generally have high expenses and low investment returns.

One redeeming feature in the modern framework for retirement services is the role of the fiduciary, the subject of this dissertation. A fiduciary relationship is governed by legal principles handed down from common law since the Roman Empire. A fiduciary standard on a federal level as applied to pension plans under ERISA has been in place since the early 1970s. Essentially this means that the people put in charge of a pool of retirement assets, whether the pension committee of a corporate or state pension fund, have the obligation to manage the assets on behalf of the beneficiaries, current and future retirees, as if the assets were their own. This is also known as the Prudent Person rule, a legal maxim restricting the discretion in a client's account to investments that a prudent person seeking reasonable income and preservation of capital might buy for his or her own portfolio.

Most involved in this process of investment management, where some element of discretion over the investments is exercised, are held to a fiduciary standard. Professional service providers receive a fee for service. So, a simple transaction of fee for service is held to a much higher standard than a typical transaction as it relates to most other commodities. Typically the problems in such relationships stem from conflicts of interest (i.e., self-dealing). The law governing these relationships is both intricate and complex.

Given the turbulent nature of the business cycle in the overall economy (e.g., recessions and depressions), many households struggle during periods when unemployment rises and household income drops precipitously. A weakened family structure combined with the cyclical nature of the overall economy, gives further impetus to having institutions like pension plans – managed by fiduciaries – in place to safeguard the retirement income of our elder citizens. This need is especially evident during and after the

more virulent cycles, such as the Great Depression of the 1930s and the 2008 Global Financial Crisis (GFC).

Recent regulatory reform, partially mandated by the 2010 Dodd-Frank Act, and pushed by the Obama Administration, has established a fiduciary standard for any financial advisor providing retirement planning and investment services, which applies to most retail investment advisors and financial planners, all 401(k) advisors and many investment managers.⁹ This campaign to expand the fiduciary standard came at a time with enhanced scrutiny on fees.¹⁰

So, while capitalism clearly has a role in our retirement system, to say this is a pure form of capitalism would be misguided. One can imagine a system, with no government involvement, where employers would offer the best retirement plans to attract the best workers, or alternatively, individuals would treat retirement (i.e., longevity risk) like they do any other type of risk or “insurance” product bought on the open market such as insurance for life, property and casualty. In such a system the idea of a social safety net for the most desperate elements in our society, such as the infirm or the mentally incompetent, could still co-exist.

So, applying a pragmatic test, a system that is more efficient because of capitalism, and a moral test to this system, a system that promotes freedom, it is difficult to say capitalism fails these tests because capitalism’s role is both limited and distorted by the government’s role within the Welfare State.

⁹ “Obama Backs New Rules for Brokers on Retirement Accounts: Proposal requires advisers to put clients’ interests first” by Andrew Ackerman and Karen Damato, *Wall Street Journal*, February 23, 2015

¹⁰ “Is Wall Street Eating Your 401(k) Nest Egg?” By Chris Arnold, *NPR*, October 19, 2015
<http://www.npr.org/2015/10/19/445322138/is-wall-street-eating-your-401-k-nest-egg>

Background on Pensions and Investments

A brief primer on the basics of pensions and investments is necessary before we continue. **Appendix A – Definition of Key Terms** includes a complete glossary of investment-related terminology.

A portfolio of investments (bonds, stocks, and alternative investments including real estate, private equity and other “real” assets, such as commodities) is managed to support the specific objectives of an individual (e.g., saving for education or retirement) or organization (e.g., providing funding for a college endowment). Investments have risk and, therefore, must be managed in accordance within a number of constraints specifically including liquidity needs, time horizon, tax considerations, legal and regulatory requirements and unique situational circumstances.

Pensions are managed in light of these objectives, but have some additional constraints specifically regarding demographic characteristics among current and future retirees, which along with market conditions will impact funding requirements. They also have significant regulatory oversight, particularly in the case of private pensions. These two aspects alone drive a complex funding and management structure that requires additional outside expertise and other service providers including actuaries, investment consultants, investment managers, Third Party Administrators (TPAs), custodians, etc. Actuaries evaluate mathematically the funding requirements to ensure benefits are paid to future retirees. Consultants advise on the portfolio, and managers make investments. TPAs process benefit payments on behalf of plans, and a custodian is a specialized financial institution responsible for safeguarding financial assets.

The discount rate plays a key role in assessing whether the pension plan has enough assets to meet its future pension obligations (also known as liabilities). The discount rate

reflects what the plan's assets can reasonably be expected to earn over the long term. From this are subtracted the cost of running the pension plan and provisions for major adverse events, such as asset declines due to economic recessions. Plan sponsors make annual required contributions to maintain the asset base in relation to the projected liability obligation (PBO). The hope is that the investment returns will be enough (either to meet or exceed the discount rate) to offset as much as possible the ongoing and future required contributions.

The discount rate is approved annually by the plan's board members. This is one of only many decisions that a board must make throughout the year, but it is an important one. The process to set the discount rate must be robust enough to ensure this assumption is reasonable and appropriate for the plan. The discount rate must be realistic to avoid masking plan funding issues that could impact future generations of retirees and plan members. For example, if the assumption is too high and investments earn less than expected, a funding shortfall could result, requiring younger and future plan members to contribute more to the pension plan, receive lower benefits, or both. If the assumption is too low, current members could pay more than necessary for their pensions or benefits may be reduced more than necessary.

Problems of the Current Retirement System

Many state and local retirement plans are on an unsustainable course, having failed to set aside enough money to fund the promises they have made.

- The Pew Charitable Trusts¹¹

¹¹ <http://www.pewtrusts.org/en/projects/public-sector-retirement-systems>

The current system is failing under the American capitalist system, but to call it a “market failure” and attribute this to capitalist precepts – as many current socialist thinkers argue in discussing neoliberalism – is a misinterpretation of what capitalist thought, in particular, classical liberalism espouses.¹² Essentially, the answer is more nuanced. This claim also ignores the inertia of social systems and institutions that evolve over time around a social problem (Ferguson, 2008). Our retirement system took a long time to develop and the social, political and market forces that formed it did not spring from a pure Smithian ideal and vision of the future, but – I would assert – rather a corruption of that ideal.

I would, in a number of ways, draw comparisons of the failure of our retirement system to the failure of our health care system, which is another form of state interventionist capitalist system with similar symptoms: over-capacity with a proliferation of products and services, many of which are poor and ineffective; costly, inadequate coverage for many Americans; heavily bureaucratic and regulatory infrastructure, and a general lack of transparency and accountability among institutions.¹³

First, let us identify the failures and then examine the root causes of each:

1. **Most people are unprepared.** Clearly, people are not saving enough for retirement.¹⁴ Is this because people have no regard for their future welfare, and are acting irrationally? Or is it because corporations and governments are not making sufficient provision for retirement savings, and are somehow leading people into a false sense of security?

The problem is two-fold: 1) moral hazard; and 2) deficiencies that are psychological/behavioral in nature. First, the perception of government and corporate-

¹² Judt, T. (2010). *Ill fares the land*. New York: Penguin Press.

¹³ Hiltzik, Michael, “The U.S. healthcare system: worst in the developed world”, Los Angeles Times, June 17, 2014

¹⁴ The Retirement Crisis: Is it Worse than We Think?, by Nari Rhee, Ph.D., National Institute on Retirement Security, June 2013

sponsored programs, most notably Social Security and Medicare, well-funded in the past, likely telegraphs to future retirees that the system is adequate, and, therefore, any risk has been effectively transferred to the providers of these programs. This is a clear example of moral hazard, which is a concept taken from insurance and defined as a lack of incentive to guard against risk where one is protected from its consequences.

However, this perception is changing. A recent T. Rowe Price survey showed that Millennials are increasing their rates of participation in 401(k) plans. When asked why, the most common answer was due to concerns about the future solvency and availability of Social Security.¹⁵ A recent survey by the International Foundation on Employee Benefit Plans shows that 71% of Americans are concerned about the security of their future retirement. However, concern does not necessarily translate into action around that concern i.e., saving more.¹⁶

Secondly, behavioral finance research has uncovered a number of heuristics and biases impacting people's ability to make effective retirement decisions (Benartzi and Thaler, 2007). Inherent behavioral deficiencies likely can be neutralized with education, e.g., basic financial literacy, and reducing poor retirement decisions for most people. This applies to those making decisions on their own investments, as well as those making decisions on behalf of others, i.e., trustees of pension boards. Our system of education is woefully inadequate in preparing people for making and managing financial decisions.¹⁷ This has created generations of Americans who suffer from lacking an essential working knowledge of planning and household budgeting, management of credit, saving and investing.

¹⁵ "Think Millennials Are Neglecting 401(k)s? Think Again," *ThinkAdvisor*, May 22, 2015

<http://www.thinkadvisor.com/2015/05/22/think-millennials-are-neglecting-401ks-think-again>

¹⁶ 2015 Annual Report, International Foundation of Employee Benefit Plans, p. 7

¹⁷ <https://www.financialeducatorsCouncil.org/financial-literacy-statistics/>

2. **The current public pension system is underfunded, and may require deep cuts in benefits in the future.** This will further add to the financial insecurity of millions of future retirees. If people cannot provide for themselves, what happens when institutions also fail them?

The current public pension system is comprised of state and municipal pension plans and Social Security. According to a report by Morningstar in 2012, over 40% of states had a funding ratio of less than 70%, a level Morningstar considers fiscally unsound.¹⁸ Furthermore, this condition has been masked by current accounting standards, and despite the relative improvement from rising stock market valuations.

For example, a report by the Center for Retirement Research at Boston College indicated the aggregate funded level for 126 large pension plans it sampled would decline from 76% based on fiscal 2010 levels to a much lower level of 57%, when these changes became in enacted in 2014-15. The same report cited a study by the actuarial firm, Milliman, which found a \$1.2 trillion gap for the largest 100 public pension plans. Here is but one example of the actuarial and accounting financial shenanigans being played in the public sector causing such disparities: the Pension Protection Act of 2006 requires a discount rate as applied to corporate pension plans as determined by an appropriate market corporate bond yield, typically in the 4.5% range; but the average public pension plan – not subject to the same rules – uses a discount rate of 7.74%.¹⁹ Such a gulf in discount rates means that for public funds their liabilities may be severely understated relative to the more restrictive corporate method, as much as \$3 trillion depending on the method used.

¹⁸ Barkley, Rachel, "The State of State Pension Plans: A Deep Dive Into Shortfalls and Surpluses", *Morningstar*, November 26, 2012

¹⁹ Bui, Truong and Randazzo, Anthony, "Why Discount Rates Should Reflect Liabilities: Best Practices for Setting Public Sector Pension Fund Discount Rates", Reason Foundation Policy Brief No. 130 September 2015

So dire is the pension funding in the state of Illinois that the legislature was cited by the SEC in 2013 for misleading the investing public in its municipal bond offerings because of improper disclosure of the state's mismanaged and underfunded pension fund. The SEC has taken similar action only one other time in history – at the state level (the municipal level is not altogether uncommon) – with the state of New Jersey in 2007.²⁰

This crisis took a new turn in 2015 when the city of Chicago was blocked by the Illinois Supreme Court from reforming its municipal pension system through benefit reductions, citing constitutional guarantees that could not be modified *ad hoc*. Moody's, a bond rating agency, subsequently downgraded Chicago municipal bonds to "junk" status, meaning that the bonds were no longer viewed by the ratings agencies as being of sufficient credit quality to be defined as investment grade. This reflected the worsening fiscal outlook for the city and the increasing probability of a future default on the city's borrowings due to its growing unfunded pension obligations.²¹

The decline in public pension systems is one that is being driven in large part by government intervention in the market that has almost no relation to a capitalist structure. With little accountability by the people in government in the face of lower returns, and greater cost increases in benefits, in many cases benefits guaranteed under state constitution as in the case of Illinois, these issues combine to make this situation hard to reform and virtually untenable to sustain (Ennis, 2007).

3. Most corporate plans no longer guarantee benefits, and have shifted the funding and investment burden to workers. As already highlighted, since the 1980s, companies have been freezing or shutting down their Defined Benefit

²⁰ "Illinois is Accused of Fraud by S.E.C." by Mary Williams Walsh, *The New York Times*, March 11, 2013. http://www.nytimes.com/2013/03/12/business/sec-accuses-illinois-of-securities-fraud.html?_r=0

²¹ "Chicago credit rating plummets to junk status following pension ruling", May 12, 2015, *Chicago Tribune*. <http://www.chicagotribune.com/news/local/politics/ct-chicago-credit-rating-junk-status-met-0513-20150512-story.html>

pension funds, and instead opting to provide Defined Contribution plans (Skinner, 2007). This represents a further erosion of the safeguards provided institutionally by the private sector.

Continued reductions in benefits, both in terms of healthcare and retirement, reflect the reality of an ongoing decline in worker benefits and wages overall. However, this is also occurring at a time of rising healthcare costs, which is further exacerbating the situation. One reason for the worsening position of U.S. workers has to do with competition from abroad. The U.S. was abnormally favored in the post-World War II period as it capitalized on the global destruction left in the War's wake. However, U.S. hegemony in both business and politics could not last forever.

In the modern era, it is likely that many of us, by assuming that the future will look very similar to the past, suffer from a fallacy of extrapolation. Times have changed since many benefit schemes were put in place. Many came at a time when U.S. corporations were dominant globally, enormously profitable and labor unions were strong. The two groups essentially came together and made promises to workers that seemed reasonable at the time, but were completely unsustainable in a world of increased competition and slowing economic growth.

Nowhere did we see this play out more succinctly than the near collapse of the U.S. auto industry during the 2008-09 Global Financial Crisis (GFC). Here we witnessed the consequences of the promises made decades ago by auto industry management and labor unions. As sales collapsed, it became clear that these companies could no longer fund their obligations, especially the enormous ongoing payments required for retirees. As I heard someone once quip, "General Motors is a pension fund that happens to produce cars in its spare time".

So, the choices are what they are for U.S. companies: offer plans that may be too costly to maintain in the future, or limit financial risk and make contributions to retirement savings accounts, but no longer guarantee the benefit payout. On this point, industry has clearly voted. What about the companies that do not offer any plans? While most medium-sized and larger sized enterprises offer some kind of retirement plan, only 14% of small businesses, defined as companies with less than 100 employees, offer a plan. The primary reason: too costly.²² President Obama in his 2016 State of the Union address called for reforms to directly address this issue such as changing the law to allow small business to band together to offer multi-employer 401(k) plans across industries. Today they are restricted to being offered only within a common industry. A reform package would include subsidies and tax deductions to incent the funding of such plans.

For those who have access to a plan, which represent over 80% of full-time working Americans, with proper saving and investing a secure retirement could be within reach.²³ For small business and part-time workers, the segments of the economy that fall within a “retirement gap”, there are policy considerations to expand coverage, as in the way the Affordable Care Act (ACA) extended health care to close this gap.

- 4. Longevity and demographic trends are a persistent headwind.** People live much longer lives today.²⁴ Longevity risk, as it is known in the retirement business, is a reality and a costly matter. At the same time, population replacement, as fertility rates have steadily declined over the past century, means that relative to the growing number of retirees there are fewer workers contributing to the system to

²² “Why Small Businesses Don’t Offer Retirement Plans: Small companies generally provide high-cost retirement benefits, if they offer them at all.” By Emily Brandon, August 12, 2013, *U.S. News*
<http://money.usnews.com/money/retirement/articles/2013/08/12/why-small-businesses-dont-offer-retirement-plans>

²³ “401(k) Fast Facts”, American Benefits Council, March 2014,
http://www.americanbenefitscouncil.org/documents2013/401k_stats.pdf

²⁴ University of Oregon, <http://mappinghistory.uoregon.edu/english/US/US39-01.html>

cover benefit payments. These two persistent conditions will no doubt ensure that the system will continue to struggle into the future.

Currently, it is forecast that Social Security trust fund will run out of funding in 2034 due to this problem alone, unless the system is reformed. That reform is likely to come in the form of deferred retirement ages when beneficiaries may begin collecting payments, reductions in benefits or both. This problem is evident across the developed world, and varies only to the extent of the severity of the problem. For instance, Germany's population is forecast to fall by 30% by 2150, which will likely impact not only retirement security, but the overall standard of living of that country.²⁵

It is for this reason that the Melbourne Mercer Global Pension Index assigns Germany an overall grade of C+, in particular scoring a D in the category of Sustainability. Japan's outlook is even worse, scoring an overall grade of D, with an E in the category of Sustainability. The U.S., by the way, with moderately better fertility rates and immigration policy, scores a C in its overall grade, with C's across the board in every category.²⁶

The cost of health care further exacerbates the retirement security problem, as the largest consumers of health care, of course, are retirees. The Social Security Trustees 2015 Report forecasts, in addition to Social Security costs rising from 4.5% of GDP to 6%, that Medicare will also rise from 3.75% to 5.75% by 2030 and 2035, respectively. This is a problem getting worse as more and more people retire each year, from the over 80 million people that comprise the Baby Boom generation.²⁷

²⁵ "Expert Group Meeting on Policy Responses to Population Ageing and Population Decline", Population Division, Department of Economic and Social Affairs United Nations Secretariat, New York, 16-18 October 2000

²⁶ Melbourne Mercer Global Pension Index, 2014 <http://www.globalpensionindex.com/wp-content/uploads/2014-Overall-Grades.jpg>

²⁷ A Summary of the 2015 Annual Reports, Social Security and Medicare Boards of Trustees, <http://www.ssa.gov/oact/trsum/>

Unfortunately, no one particular conditional factor, i.e., demographic, educational, etc. – or institutional factor, i.e., public and corporate funds, Social Security – is alleviating the problem of insufficient funding for millions of retirees. If anything, the problem is being compounded by many of the same issues driving the failure of our health care system. Many believe that the hybrid model of state capitalism represents a corruption of the pro-market ideal, and has created a system of incentives that is self-defeating to the goals of society, in particular the health and retirement security of our citizens.²⁸

In summary, future focus should be spent on reviewing the necessary reforms to our current system. Education should be a part of that solution – especially as people are being asked to do more – and help empower current and future generations to begin the process of saving and investing for retirement early in working life. Additionally, there will be many tough reform battles ahead that will likely be played out in and outside of the courts, as we are already seeing in places like Chicago.

The good news is that most full-time working Americans have access to a Defined Contribution plan. For those who are part-time or working for a small business that does not offer a plan, this is one area that could be strengthened by public policy. One place government could potentially have a much expanded role is in the area of providing education to our citizens to promote financial literacy. This would potentially drive greater participation and savings into our system of employer-offered retirement plans.

Finally, the system could also benefit from greater transparency, awareness and oversight on the individuals administering retirement plans, and other dedicated funds such as endowments and foundations, both in the public and private sectors. According to the Pew Charitable Trusts,

²⁸ Cavanna, H. et al, *Challenges to the Welfare State: Internal and External Dynamics for Change*, Forum International des Sciences Humaines, Paris, France, 1998

Democracy is well-served when informed and engaged citizens are able to exercise their most important civic duties—especially voting. But the American people also need to know that federal, state, and local leaders spend (and manage – author’s addition) taxpayer dollars efficiently and wisely.²⁹

A system for measuring and evaluating the effectiveness of fiduciaries is the subject of this dissertation.

U.S. Public Pension System Characteristics

Our study sample set is derived from 163 public pension systems representing \$1.4 trillion in assets, or 47% of the total assets of the overall system. These systems represent most of the states and larger city and county municipalities. According to the U.S. Census there were 6,299 retirement plan systems with total assets in 2012 of over \$3 trillion. In addition there are approximately 4,000 municipal bond issuers. As we will see in later sections the role of the municipal bond market is particularly important when it comes to today’s public pension system.

We apply the lens of corporate governance theory to understanding performance differences of boards of asset owners given readily available data. That being said, when working with public pension fund data there are some unique characteristics of the U.S. public pension system – which are, of course, governmental bodies – that must first be understood.

Figure 1 provides a conceptual overview of the U.S. public pension system as it relates to governance and the many variables that influence financial strength and performance. There are two primary sources of funding for public pensions: investment

²⁹ <http://www.pewtrusts.org/en/topics/governing>

returns and contributions. Over the last five years 67% have come from investment returns, 23% from employer contributions and 10% from employee contributions.³⁰ Our focus is on the fiduciary effectiveness of public pension boards that impact two-thirds of the funding. However, the fiscal prudence and management of the plan sponsor (states and municipalities) will also influence the other third. These two contributions combine to meet the actuarially determined annual required contribution (ARC). The adequacy and consistency of contributions, in addition to other dynamic factors that drive ongoing shifts in plan valuation, will influence the funding status and overall financial health of the plan.

Endogenous factors, factors that are primarily under the control of the board and plan sponsor organization include 1) governance practices; 2) fiscal management of the municipality; 3) hiring and compensation practices as it relates to the plan beneficiaries (i.e., employees); and 4) actuarial and accounting practices and norms. Exogenous factors, factors that are either mostly or completely outside the control of the board and plan sponsor include: 1) demographic factors, i.e., how young or old the plan beneficiary population is; 2) financial and market conditions, which influence asset prices and interest rates; 4) political processes; and 5) economic conditions, which can significantly impact tax revenue.

As the health of the pension plan declines two things start to happen. As we note in the later section, “Bond Vigilantes: When Governance Fails”, the imputed interest cost of a sponsoring municipality’s bonds increases as the bond yield spread widens, reflecting growing risk aversion among investors. As bonds come under selling pressure, prices decline and yields increase. Secondly, and over much longer periods of time, often – but not always marked by crisis – a legal wrangle begins to occur. Municipalities, to stem the

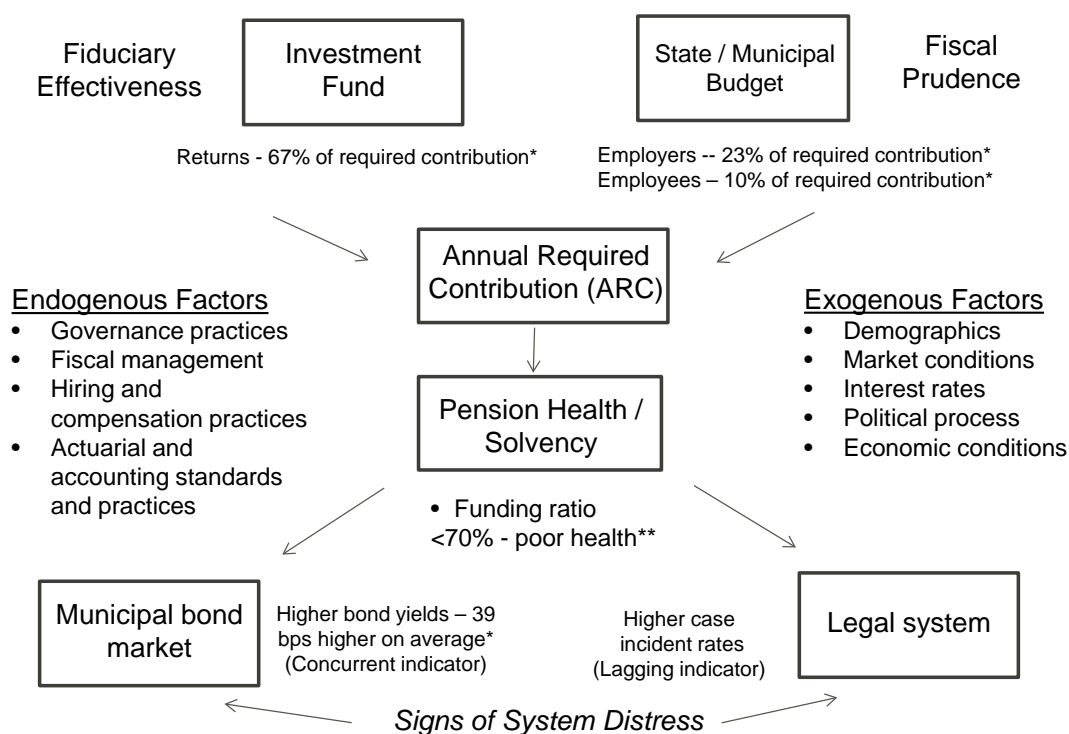
³⁰ DeGroot, Peter, Narayan, Karthik, and Henriques, Drew, “U.S. Fixed Income Markets Weekly: US Pension Plan Update: Underfunded plans to have a higher spread beta to an economic downturn necessitating increased due diligence”, J.P. Morgan, June 10, 2016, p. 13

funding problem, will engage in “pension reform” by reducing benefits either through outright benefit reductions or increasing denial of benefits. This begins to manifest itself in a growing number of court cases as beneficiaries seek legal remedies to the problem. Increasing bond spreads and the growing frequency and magnitude of courts cases are all indicators of a system in distress.

It is for these reasons we have focused in this study on both governance and legal factors in assessing both pension plan performance and sustainability.

Figure 1 – U.S. Public Pension System Overview

U.S. Public Pension System Overview



Source: JP Morgan (2016) – average percentage contribution of the last five years
**Morningstar (2013)

Asset Owners and Governance Fiduciaries

There are many different kinds of asset owners in the world. They range from very large sovereign wealth funds to small private family foundations. **Figure 2** shows asset owners in the U.S. by size of assets and number of organizations. There is one characteristic that all asset owners have in common: every single fund is overseen by a group of trustees or governance fiduciaries.

Figure 2 – Asset Owners in the United States, 2012



Source: NACUBO, Federal Reserve, U.S. Census, 2012
 FoundationSource, 2014
 *Assumes average of seven board members per organization.

According to the Foundation for Fiduciary Studies (Ober, 2005), a fiduciary is someone who:³¹

- Manages property for the benefit of another;
- Exercises discretionary authority or control over assets; and
- Acts in a professional capacity of trust and renders comprehensive, continuous investment advice.

³¹ “Fiduciary Responsibility: Liability and Consequences, Stuart Ober, AIFA, *Journal of Financial Planning*, 2005, p. 51

According to the CFA Institute's *Code of Ethics and Standards of Professional Conduct*, Standard III(A) – Loyalty, Prudence, and Care – “requires CFA members and candidates for the CFA designation to exercise a duty of loyalty to their clients, act with reasonable care, exercise prudent judgment, act for the benefits of clients and place their clients’ interests before their own...(and a Fiduciary is someone) who exercises – discretionary authority or control with respect to management of the plan or management or disposition of its assets.”³²

The financial fiduciary plays a significant role in our economy. In the simplest terms, fiduciaries are charged with achieving the risk-return objectives for their clients. Ober (2005) states that virtually every investment decision at the institutional fund level is made by a fiduciary, representing control of over 80% of the investable financial assets in the U.S.³³ So, our system of financial oversight and control means that, for most Americans, investment decisions are in the hands of a relatively small group of individuals. There are an estimated 5 million people who act in the capacity of financial fiduciaries, or about 1.6% of the overall population.³⁴

The term Fiduciary encompasses “the more than five million people who have the legal responsibility for managing someone else’s money, including members of investment committees of retirement plans, foundations and endowments; trustees of private trusts; and investment advisors.”

The causes of the 2008 Credit Crisis in the United States and ensuing Great Recession were many, and have been studied and analyzed in great detail over the last few years. *The Wall Street Journal* in a 2011 editorial boiled it down to a list of ten essential

³² “Proposed Rule: Definition of Fiduciary under ERISA”, CFA Institute Letter to the Department of Labor, February 2, 2011

³³ *ibid*

³⁴ “Fiduciary Responsibility: Liability and Consequences,” Stuart Ober, AIFA, *Journal of Financial Planning*, 2005, p. 51

factors that included a speculative and combined bubble in credit and housing, a proliferation of non-traditional mortgage products, failures in credit rating and securitization, a herd mentality of large and mid-sized financial institutions, which through the use of leverage amassed enormous positions in these securitized products. All of which ultimately led to extensive counterparty risk, contagion, financial firm failures, shock and panic across the financial markets, and a severe recession.³⁵

The impact this had on retirement savings and pensions was, of course, significant and far-reaching. This is due not only to the decline in assets during the deep market downturn, but more insidiously, and even after markets recovered, to the historically low and protracted interest rate environment we have seen since 2008. Low interest rates punish savers and individuals on a fixed income, typically retirees, and degrade the funding position of pension funds, as well as their ability to earn a return on fixed income investments. It is likely that the additional risk taking occurring in public pension funds is also due to the extremely low interest rate environment as observed by recent research conducted by the investment consulting firm, Callan.³⁶

The Financial Crisis Inquiry Commission, which was commissioned by Congress to determine the exact causes of the crisis, completed its 662-page report in January 2011.³⁷ While the report notes among its list of summary conclusions of the “systemic breakdown in accountability and ethics”, and points to several groups of culpable individuals ranging from lenders to regulators, it does not once in the entire report make any mention of the word, “fiduciary” or explain the role of those who have control over the vast majority of

³⁵ “What Caused the Financial Crisis? Congress's inquiry commission is offering a simplistic narrative that could lead to the wrong policy reforms” By Bill Thomas, Keith Hennessey And Douglas Holtz, *The Wall Street Journal*, Jan. 27, 2011 <http://online.wsj.com/news/articles/SB10001424052748704698004576104500524998280>

³⁶ Martin, Timothy W., “Pension Funds Pile on Risk Just to Get a Reasonable Return An investor used to get a 7.5% return by holding safe bonds: To earn that now, research finds, takes a more volatile mix”, *Wall Street Journal*, May 31, 2016

³⁷ “The Financial Crisis Inquiry Report”, January 2011 http://fcic-static.law.stanford.edu/cdn_media/fcic-reports/fcic_final_report_full.pdf

investment decisions. Others have described where investment managers did have a role following the report, for example, Manconi et al (2012) describe how institutional investors propagated the crisis in terms of a financial mechanism, but not from a fiduciary standpoint.³⁸

And yet, following the crisis, one of the public policy measures under consideration has been expanding application of the fiduciary standard to include not just investment advisors, but virtually anyone who buys or sells a security on behalf of a client.³⁹ As mandated by the Dodd-Frank Wall Street Reform and Consumer Protection Act of July 2010, Section 913 of the Act called for a study followed by new regulations of broker/dealers and investment advisers (Trone and Harvey 2010).⁴⁰ The study is required to document specific differences between the broker/dealer suitability standard and the investment adviser fiduciary standard. Effective June 7, 2016 the Department of Labor (DOL) Fiduciary Rule went into effect, but while it only applies to qualified retirement accounts (i.e. 401(k) and IRA accounts), it will still impact the vast majority of investment professionals.

This information is presented as background regarding the current environment concerning the Fiduciary Standard. While the Fiduciary Standard has evolved over the last century, and is clearly going through another period of evolution, the purpose of this study is to examine the link between fiduciaries and relative and absolute measures of fiduciary effectiveness. A blunt measure of fiduciary effectiveness is the risk-return performance of the financial assets the fiduciary manages. Board size, board turnover and use of an investment consultant are just a sampling of the characteristics that are likely to impact fiduciaries' investment decisions and ultimately their effectiveness.

³⁸ The role of institutional investors in propagating the crisis of 2007-2008, *Journal of Financial Economics*, Vol. 104, No. 3, pp. 491-518, June 2012 Alberto Manconi Massimo Massa Ayako Yasuda

³⁹ "The Need for a 'Harmonized' Fiduciary Standard", Donald B. Trone, RFTM and Louis S. Harvey, RFTM, FOUNDATION FOR FIDUCIARY STUDIES, August 29, 2010

This research compiles data on fiduciary characteristics of organizations, their attributes, processes and practices, as well as their investment performance. Through econometric modeling, we analyze these processes to ascertain whether there is a link between fiduciary practice and performance, and from that examination determine whether practices, as defined by law and understood broadly across academia and industry, directly result in certain performance outcomes. In other words, does better process drive better outcomes, and can a rating, measure or index be used to quantify this effectiveness? Additionally, the findings of the study allow us to contemplate how people and organizations may be held accountable to such a rating in today's system of asset owner governance.

Statement of the Problem

Statutory fiduciary standards relative to management of institutional funds by organizations offer little guidance from a process point of view. In today's world, investors, donors, taxpayers and beneficiaries are likely to be poorly equipped to objectively evaluate an organization's fiduciary effectiveness or distinguish the effectiveness of one organization in managing its assets over another. A disconnect exists between an organization's process under the standards, and the outcome of this process, the overall effectiveness of the organization and, in particular, its investment performance. This is a ubiquitous problem for virtually all citizens, as stakeholders of such organizations charged with fiduciary obligations include taxpayers, investors, beneficiaries, and donors. As Cackowski (2007) observes:

Fiduciary standards governing the selection of investment managers and the monitoring of investment decisions offer very little operational guidance. The guidance

cautions little more than that the fiduciary exercise ordinary prudence, diversify and adhere to Modern Portfolio Theory. No specific process or quantitative measures are defined. One scholarly commentator found the standards so ill conditioned that he dubbed them “Voodoo Investonomics”.

And yet the common wisdom could be that as long as a prudent process is followed then the obligations of the fiduciary standard have been met. This view assumes that outcomes under the standard are impossible to judge, and, therefore, the performance outcome, in particular, is systematically ignored. At most, as noted here by Hatton (2005), a successful process is believed, but by no means guaranteed, to result in good performance.

*Any investment adviser – fiduciary or non-fiduciary – that implements the process described in these Practices should feel confident that they are living up to the responsibilities they owe their clients. **It is, after all, process that determines prudent fiduciary conduct, not portfolio performance, according to principles of modern prudent investing.** And although prudent conduct is not determined by investment performance, one of the most powerful reasons to implement the...Practices...is that in many cases performance can improve significantly as a result.*

The logic of this system implies that adherence to the fiduciary standard is an “either-or” proposition: either the organization is effective in meeting the standard or it is not. Crucially, this means that judging an organization as ineffective occurs usually in a post-mortem, after something has gone terribly wrong with the organization, such as a significant erosion in financial position, bankruptcy, fraud, litigation case or regulatory violation. Public awareness of such a condition is likely not to be widespread until it appears as a headline in the news.

There are a number of common problems that limit the effectiveness of boards and committees. Ambachtsheer (1998) in a survey of 50 senior pension executives found an overwhelming 98% cited poor process a major hurdle to achieving investment goals. In addition, other factors cited as barriers included: inadequate resources (48%), lack of focus / mission (43%), conservatism (35%), and insufficient skills (35%).

When pensions underperform or fail, it can be at great cost to society at large. For private plans it can mean significant cuts in benefits, for public plans cuts in benefits and an additional burden on taxpayers. Today in the United States there are 23,000 private pension plans helping to protect the retirement security of over 32 million workers. Additionally, there are 10 million workers in 1,400 multi-employer plans. In 2013, 111 newly failed plans were moved to the Pension Benefit Guaranty Corporation (PBGC), which exists to take over corporate pension plans in the event of a bankruptcy. Currently, PBGC pays monthly retirement benefits to approximately 900,000 retirees of 4,600 failed defined benefit pension plans. Including those who have not yet retired and participants in multi-employer plans receiving financial assistance, the PBGC is responsible for the current and future pensions of about 1.5 million people.

While PBGC will soften the blow of a corporate bankruptcy to a pensioner, it only pays a fraction of the benefit that would have been paid by the original corporate plan. While the number of failures has fallen since the Global Financial Crisis (GFC), by 2013 the total number of failed plans at PBGC had grown over a three-year period by almost a third.⁴¹

Currently, a single multi-employer plan (MEP), the Teamsters Central States Pension Plan, with its over billion dollar-funding gap, is threatening to swamp the solvency of PBGC. PBGC is already running a \$42.4 billion deficit on its MEP program, more than five times the

⁴¹ Pension Benefit Guaranty Corporation, <https://www.pbgc.gov/documents/2013-annual-report.pdf#page=9>

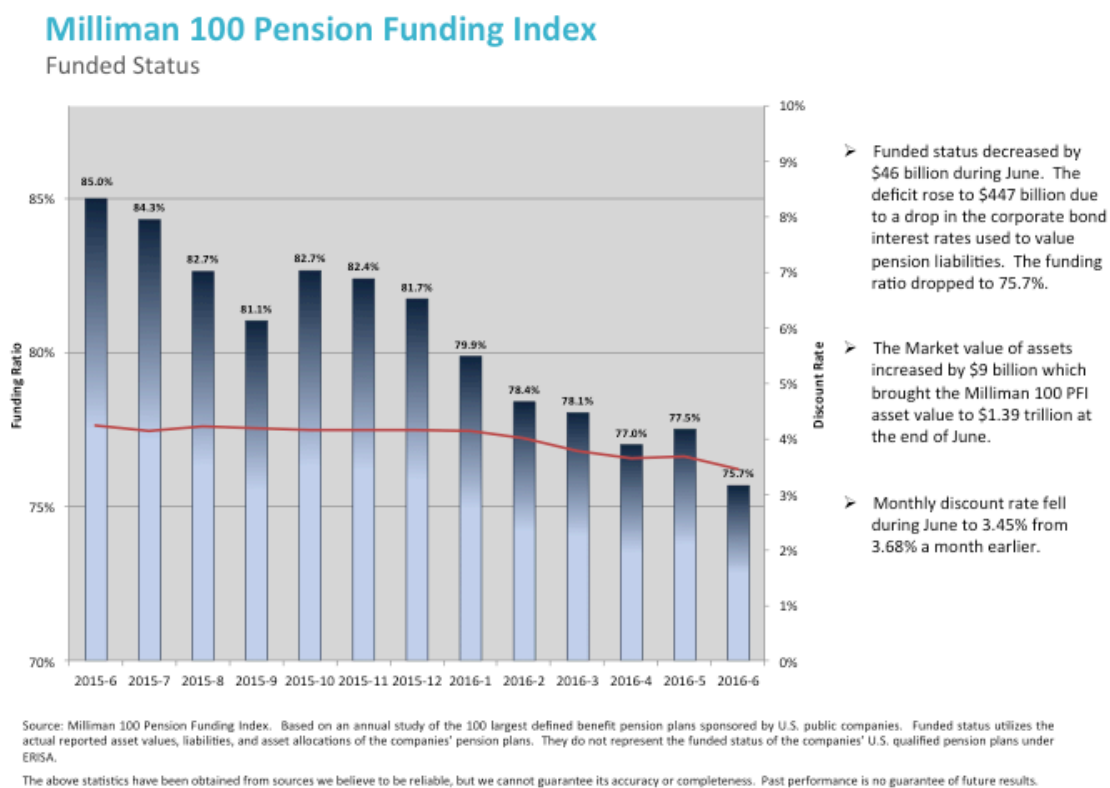
single-employer program. The U.S. Treasury is reviewing a proposal to reduce benefits under a new law enacted by Congress in 2015 allowing reductions of MEP benefits for plans in dire straits.⁴²

The current historical low interest rates have only exacerbated the situation for pensions, especially corporate pensions whose liabilities are more directly tied to market interest rates. According to the Milliman 100 Pension Funding Index, which is based on the 100 largest defined pension plans sponsored by U.S. public companies, the funding ratio has dropped in the last year alone from 82.7% to 75.7% (see **Figure 3**).⁴³ This has happened as a result of the decline in the discount rate, which has fallen to an all-time low, from just over 4% to 3.45%. To illustrate this significant decline in dollar terms, in June 2016 alone the funded status of the Milliman 100 fell by \$46 billion, which is over 10% of the outstanding funding deficit of \$447 billion.

⁴² Horowitz, Carl, "Teamsters Central States Pension Fund Puts PBGC in Jeopardy", National Legal and Policy Center, October 19, 2015

⁴³ Source: Robert W. Baird & Co.

Figure 3 - Milliman 100 Pension Funding Index



Turning to state and municipal pension plans, the common problem for this category of funds is chronic underfunding. As noted earlier, many states have low funding levels. In June 2016, the average funding level for state public plans was 69.9%, below the critical 70% level threshold (as noted earlier, anything below 70% Morningstar defines as “fiscally unsound”).⁴⁴ Furthermore, new GASB standards that came into effect beginning in 2014 have brought the levels down further from prior years. GASB, or Government Accounting Standards Board, is the organization that sets accounting standards for financial accounting of governments (FASB, or Financial Accounting Standards Board, is its

⁴⁴ Milliman, Public Pension Funding Study, 2016, <http://www.milliman.com/ppfs/>

counterpart for corporations). A combination of stricter liability calculations along with greater transparency is finding its way into bond ratings.

...The change in accounting standards is expected to lower the overall funded levels. A recent report by the Center for Retirement Research at Boston College indicated the aggregate funded level for 126 large pension plans it sampled would decline from 76% based on fiscal 2010 levels to a low 57%.

As noted earlier, there is a large gap nationally for public pension funding, and the SEC is exercising enforcement as much as it can through enforcement of municipal bond disclosure. Despite their large influence in the securities markets, the SEC does not have oversight on public pensions directly. As described in Chapter II, the states themselves have direct authority over their own pension systems. In 2013 the agency went after the state of Illinois, with the worst funding problem in the nation.⁴⁵

Since that time the pension crisis has only worsened in the city of Chicago. As was mentioned earlier, in 2015 Moody's downgraded Chicago's municipal bonds to junk due to the underfunded condition of its pension system. This event alone has had a notable impact on the municipal bond market nationally. Recent research indicates that when breaking municipalities into two categories, those with well-funded pensions and those with poorly funded pensions; the difference in yield spread or interest cost is 1.2%.⁴⁶ The implication is that due to growing vigilance in the bond market, taxpayers pay 1.2% more to borrow funds in such underfunded municipalities. Of course, this additional cost does not go to reducing

⁴⁵ "Illinois is Accused of Fraud by S.E.C." by Mary Williams Walsh, *The New York Times*, March 11, 2013. http://www.nytimes.com/2013/03/12/business/sec-accuses-illinois-of-securities-fraud.html?_r=0. The SEC, as an agency of the federal government, is charged with investor protection and regulates the securities markets. One primary tool of the agency is ensuring that proper disclosure of the risks of investments is disclosed through the prospectus. Pension risk is a risk that can impact the performance of such bonds, and is therefore an item that the SEC will look to enforce when reviewing the disclosure around such investments.

⁴⁶ Source: Robert W. Baird & Co.

the pension liability; it is in effect “lost money”, going to bondholders simply to compensate them for the additional risk.

Similarly, the societal costs of non-profits, endowment and foundations can be high when organizations encounter fiduciary problems. All too common among non-profits is fraud and embezzlement. In 2013, there were over 1,000 organizations in the U.S. that suffered an unauthorized diversion of funds. Over half a billion dollars was lost in the top 10 cases alone. According to a study by Marquet International, an independent investigative, litigation support and security consulting firm, one sixth of all major embezzlements occur in non-profits and religious organizations, second only to the financial services industry.⁴⁷

The disconnect between fiduciary standards and effectiveness shows the perverse impact across these three major categories of institutional funds: a growing number of failed private pension plans, chronically underfunded state and municipal pension plans, and non-profit organizations with such poor oversight that they are regularly vulnerable to white collar crime. These widespread problems in our nation’s private and public pension system and non-profit sector illustrate a system of financial management operating at a level that gives cause for real concern.

Purpose

Therefore, the proposed research will undertake identification and measurement of the key factors that drive fiduciary effectiveness. To that end, we will examine U.S. public pension plans because of the more readily available information that these organizations tend to disclose to the general public. Such disclosure comes in the form of meeting minutes,

⁴⁷ http://www.upi.com/Top_News/US/2013/10/27/Analysis-Nonprofits-lost-millions-in-assets-to-fraud-embezzlement/UPI-43851382886790/

agenda, financial statements and other information, and are often posted on their websites directly or available through public databases such as the Boston College Public Retirement Plans database.

With the data we collect on the factors we identify, we test whether our model demonstrates some explanatory power on whether an organization is at risk of significant underfunding, or other fiduciary problem such as a bankruptcy, civil litigation, regulatory violation or crime. Moreover, our composite rating of fiduciary effectiveness will allow the construction of an index of relative measures, making organizations comparable side-by-side.

This composite rating system, a measure of overall effectiveness, I refer to as the *fiduciary effectiveness quotient* or *FEQ*. A higher score is indicative of stronger governance forms of - and structures within the organization, and overall greater fiduciary effectiveness. Similar to the corporate governance ratings in place today whose purpose is to inform investors about the effectiveness of companies in addressing the fiduciary responsibility of all corporate assets, this rating system would inform investors, donors and taxpayers about the potential effectiveness of the organization in managing investment pools, whether they be dedicated funds, pension plans, endowments or foundations.⁴⁸

Research Questions

The key goals for the research are:

- To investigate whether there is a relationship between an organization's FEQ and the investment returns of the organization's respective investment

⁴⁸ <https://www.issgovernance.com/>

pool to understand whether there is a link between organizational structure and behavior with performance outcomes.

- To investigate the explanatory power of the measure in identifying fiduciary problems. This will be shown by empirically back-testing an econometric model on organizations that have encountered significant fiduciary issues in the past. In the case of public pensions, significant underfunding would constitute such a fiduciary issue.

Essentially, through this research, we are taking the *prudence is process* concept to the next level, by evaluating and measuring a prudent process and tying it to direct, measurable and comparable outcomes. Courts give wide latitude to the acts of a board under the business judgment rule, a legal maxim that so long as a board can demonstrate that an informed process was followed, then the board acted prudently under that process even if the outcome was below expectations or even disastrous.⁴⁹

These are the research questions:

1. What are the attributes of an effective board, and what particular attributes drive effectiveness (as defined by a variety of financial performance measures including investment returns, funding ratios and bond yield spreads), and are these attributes measurable?
2. If so, can an organization be usefully rated on a composite, index basis for effectiveness using these measures?

⁴⁹Robins & Cole, LLP, "The Business Judgment Rule and the Entire Fairness Doctrine", <http://www.rc.com/documents/Primer%20on%20Business%20Judgment%20Rule.pdf>

3. Can these measures be explanatory of conditional outcomes (such as fiduciary problems i.e., underfunding, litigation, etc.) and directly linked to improved investment performance?

These are the two hypotheses we will test:

Hypothesis I – Relative Effectiveness: The Effectiveness to Performance Link

H₀: An organization's FEQ has no relationship to the organization's investment return defined as a one-year forward investment returns.

H₁: An organization's FEQ demonstrates a clear, positive relationship to the organization's investment return defined as a one-year forward investment return.

Hypothesis II – Absolute Effectiveness: The Probability of Being an Effective Organization

H₀: An organization's FEQ has no explanatory power over whether an organization may be designated Fiduciary Effective (absent the following conditions: significant underfunded condition, bankruptcy, civil litigation, regulatory violation, crime or other fiduciary problem).

H₁: An organization's FEQ is explanatory.

Significance and Relevance

What I propose through this study is a shift in paradigm in the way we, as a society, think about and address the role of the governance fiduciary, which has significant public policy implications. If such a scoring system or index became accessible to the general

public, organizations would have an incentive to adopt and promulgate a positive rating through investor, donor or beneficiary communications such as annual reports; and avoid a negative rating, such as in the media, to attract future contributions from donors, tax payers and investors in a highly competitive marketplace. Donors and investors would have an incentive to know in advance of making a contribution to an organization, how effectively that contribution will be managed. Taxpayers would equally benefit from a system of accountability for funds being managed by the public sector.

The statistical robustness of the research through this program could lead to the creation of a system that would “raise all boats” through providing institutions, their donors and investors, the tools by which they can measure, improve and communicate the effectiveness of their own fund management.

Organization of the Study

This dissertation is composed of seven chapters.

This was an introductory chapter to the topic. Chapter II contains background on the history and complexity of the legal environment of the fiduciary standard as it applies to asset owners. Chapter III reviews governance theory, organizational challenges including behavioral finance problems, and the characteristics of effective organizations. Chapter IV reviews the literature specific to governance and fiduciary effectiveness measures. In Chapter V the research methodology and rationale for its selection are detailed. The research design, including population and sample, are explained. The research instruments are identified, and their validity and reliability are discussed. Data collection and analysis procedures are outlined. A timeline for the study and its limitations are reported.

In Chapter VI, the data are reported and analyzed. Key governance factors are examined, the FEQ or governance index is constructed and its explanatory power assessed. Findings are compared to arguments and patterns found in the literature review. Chapter VII completes the study with a summary of the findings, implications for best practices, conclusions and recommendations for future studies.

CHAPTER II

LEGAL BACKGROUND

Introduction

Recently reforms to the Chicago Public Retirement System have been reviewed twice by the Illinois State Supreme Court and rejected both times.⁵⁰ In 2015, Congress legalized benefit reductions to multi-employer plans, and the Secretary of the Treasury is currently rejecting the proposal to reduce benefits to the Teamster's plan to keep it solvent and from becoming a ward of the PBGC, which currently threatens to fully deplete PBGC.⁵¹ A 2012 case, *Pundt v. Verizon Communications Inc.*, is now under review with the U.S. Supreme Court regarding the pension risk transference practice of corporations offloading pension obligations to insurance companies.⁵²

What do these three unrelated cases have in common? They represent the current battleground of resolving our failing pension and retirement system, and in the absence of market-driven changes or government reforms, the court is becoming the “arbiter of last resort” in determining how this failure will be shared across society. Understanding the legal background of asset owner fiduciaries is critically important to making sense of the current and future states of this problem. It is also necessary for the development of legal measures that tie in both related governance and performance outcomes, as will be explained in detail in Chapter VI.

⁵⁰ Editorial Board, Pension ruling another blow to Chicago taxpayers — and Emanuel, *Chicago Tribune*, March 24, 2016 <http://www.chicagotribune.com/news/opinion/editorials/ct-chicago-pension-ruling-unconstitutional-rahm-emanuel-edit-20160324-story.html>

⁵¹ Segal, Julie, “Can the U.S. Supreme Court Save the American Dream”, *Institutional Investor*, May 12, 2016 <http://www.institutionalinvestor.com/article/3553866/investors-pensions/can-the-us-supreme-court-save-the-american-dream.html#.Vzr-navhrBY>

⁵² Editorial Board, “Treasury’s Teamsters Bailout Ploy: By rejecting a pension rescue plan, Obama sets taxpayers up for a hit”, *Wall Street Journal*, May 15, 2016

Contemporary Legal Framework of the Fiduciary Standard

Despite the long heritage of the law of fiduciary duty, according to the legal scholar, Rafael Chodos, the modern day justice system is lacking a systematic approach:

The law of fiduciary duty draws heavily from both the law of contract and the law of tort, and it is in many ways intermediate between those two branches of the civil law. It might even be seen as a third, co-equal branch along with them. But while there is a well-developed and comprehensive theory of contract and of tort, there is presently no well-developed and comprehensive theory of fiduciary duties. As a result although there are many cases dealing with fiduciary duties...and although many principles are well-established, the decisions do not seem to share any systematic overview of this area of the law at all. ⁵³

The legal framework is complicated for several reasons:

- 1) **Federalism:** The standards may be governed by state law, federal law or both, and there may be instances where one set of laws is pre-empted by another.
- 2) **Regulatory Agencies:** There may be multiple agencies involved in the rulemaking and enforcement of these laws.
- 3) **Legal differences:** There are key differences in how the laws are used in defining and determining the standard.

According to the CFA Standards, Standard 1-A, investment professionals must have knowledge of the law to carry out their duties, so understanding the laws that govern the fiduciary standard is critical in exercising that duty:

⁵³ *The Law of Fiduciary Duty*, by Rafael Chodos, Blackthorne Legal Press, 2000, p. XIII

Members and Candidates must understand and comply with all applicable laws, rules, and regulations (including the CFA Institute Code of Ethics and Standards of Professional Conduct) of any government, regulatory organization, licensing agency, or professional association governing their professional activities. In the event of conflict, Members and Candidates must not knowingly participate or assist in and must disassociate from any violation of such laws, rules, or regulations.⁵⁴

This dissertation is focused on public pension funds (state and municipal), but also touches on other types of institutional funds including: corporate pension plans; and non-profit funds, such as foundations or endowments; and it will examine the legal framework of the fiduciary standard for each. This species of asset owners are institutional investors, also known as asset owners, and referred to in the literature as the governance fiduciary (Ambachtsheer, 1998).

This study does not focus on secondary institutional investors or financial intermediaries, also referred to as the operating fiduciary, which include insurance companies, banks, hedge funds, and mutual funds. These institutional investors have their own set of legal and regulatory frameworks further complicating the U.S. legal system governing and regulating fiduciary investment management. It also does not focus on tertiary fiduciaries, which may include Third Party Administrators (TPAs), attorneys, CPAs and other service providers, which, depending on the nature of the asset owner, will be covered by the same laws. Finally, it does not focus on private trusts. Many of the same principals and laws discussed below apply, and so private and corporate trusts have been left out to avoid repetitiveness.

⁵⁴ CFA Standards of Practice Handbook, Tenth Edition (effective 1 July 2010)

The concept of Fiduciary Duty finds its sources in Roman law. In fact, the word “fiduciary” comes from the Latin *fiducia*, which refers to the transfer of a right to a person who received it subject to an obligation to transfer it again at a future time or upon the fulfillment of a condition. This evokes the modern day idea of a trust or of an asset held in escrow (Chodos, 2000).

Fiduciary duty represents a “cluster of obligations” owed by one person, the “trustee” or “fiduciary” toward another, the “cestui” or “beneficiary”, regarding an identified subject matter, which is referred to as the “res” or “subject of the trust” (ibid).

The conditions for a relationship that gives rise to a Fiduciary Duty is characterized by the following:

- The duty has an **ambit**, meaning that it is owed toward a certain person or persons and not others (ibid).
- The duty has a **scope**, which means it entails certain obligations and not others (ibid).
- A duty may **terminate**, which means the engagement of the duty may end, but certain obligations may persist long after the termination date (ibid).
- A duty is either **discharged** or **breached**. In the case of a breach the law will impose a **remedy** (ibid).

The duty can be either **asymmetrical** or **symmetrical** depending on the situation. A trustee of a pension plan owes a duty to the beneficiaries of the plan, and the beneficiaries owe her nothing. A husband and wife are fiduciaries for one another.

The “Grammar” of Fiduciary Duty is essentially comprised of these four primary duties:

1. **Duty of Management or “Duty of Care”** It is most similar to a contracting duty; and it is the duty to do what has been undertaken to be done (ibid).
2. **Duty of Preference or “Duty of Trust”** This is the duty that is most similar to the original Roman concept, and it comes in two parts: 1) Duty of Preference is to set the interests of the *cestui* before one’s own; 2) Duty of Loyalty is to set the interests of the *cestui* before all others (third parties) (ibid).
3. **Duty to Account** The fiduciary must maintain records of all transactions affecting the *res* and provide a report of these transactions either on request or on a schedule. It means the fiduciary must not only be honest, but maintain the records proving he is honest (ibid).
4. **Duty of Disclosure** The final duty relates to the duty to account, but takes it one step further. This duty requires the trustee to keep the *cestui* fully informed as to all facts, which are or might be pertinent to the *cestui’s* interest in the trust. While the duty to account refers to transactions that have already taken place, the duty of disclosure refers to transactions that may take place in the future. These duties carry no direct benefit themselves other than to ensure the *cestui* is privy to all information, thereby enabling her to protect her rights (ibid).

The Fiduciary Standard for Corporate Pension Funds under ERISA

Today in the United States there are 23,000 private pension plans helping to protect the retirement security of over 32 million workers. Additionally, there are 10 million workers in 1,400 multi-employer plans. In 2013, 111 newly failed plans were moved to the Pension Benefit Guaranty Corporation (PBGC), which exists to take over corporate pension plans in the event of a bankruptcy.

For private sector pension plans, which include defined benefit, defined contribution, also known as 401(k) or 403(b) plans, profit sharing plans, IRAs, Taft-Hartley plans, and other qualified plans, the Fiduciary Standard as defined and governed by the Employment Retirement Income Security Act of 1974 (ERISA) is the most comprehensive and tested area of the law concerning it.

The essential elements of any plan include:

1. A written plan that describes the benefit structure and guides day-to-day operations;
2. A trust fund to hold the plan's assets;
3. A recordkeeping system to track the flow of monies going to and from the retirement plan; and
4. Documents to provide plan information to employees participating in the plan and to the government.

The Department of Labor (DOL) is the federal executive branch agency responsible for rule-making and bringing enforcement actions. Additionally, the Treasury Department's Internal Revenue Service (IRS) is responsible for the rules that allow tax benefits for both employees and employers related to retirement plans, including vesting and distribution requirements. While pension funds can be large participants in the financial markets, the Securities and Exchange Commission (SEC) has no oversight or enforcement powers.⁵⁵

⁵⁵ Department of Labor and SEC web sites
http://www.dol.gov/ebsa/faqs/faq_compliance_pension.html
[http://www.sec.gov/answers/401\(k\).htm](http://www.sec.gov/answers/401(k).htm)

Exclusive Purpose Rule (i.e., Duty of Loyalty) All activities and transactions performed on behalf of a plan must be for the exclusive purpose of providing benefits to participants and defraying reasonable expenses of plan administration.

Questions of breach of the duty of loyalty may arise where the fiduciary is deemed to fail to pursue the interest of the participants vigorously enough or where the interests of third parties are preferred to the interest of the participant.

In addition, question of breach may arise if a fiduciary is deemed to lie to or affirmatively mislead a participant or beneficiary as to plan terms or important aspects of the plan's status. The Supreme Court held that when a fiduciary speaks in his or her fiduciary capacity, the duty of loyalty requires that he or she do so truthfully (see *Varity Corp. v. Howe*, 1996).⁵⁶

Prudence Fiduciaries must exercise the same care, skill, prudence and diligence that a prudent person familiar with the applicable matter would exercise in managing similar affairs (the Prudent Man Rule). *Courts generally focus on the procedural prudence of a fiduciary decision, i.e., whether the steps taken in determining a particular action or making a particular decision were prudent.*

This duty is generally the most significant. *Regardless of the ultimate outcome of a given fiduciary decision or action, a court generally will not find a violation where the fiduciary is able to demonstrate "procedural prudence."* Thus, the effectiveness, or direct outcomes related to fiduciary action (i.e. investment decisions) is not a focus of the law or the courts. To prove procedural prudence, fiduciaries should retain written records that demonstrate (1) careful weighing of options, (2) sufficient information to make a careful decision; and (3) how the decision is reached. Where plan fiduciaries are not familiar with some aspect of a plan provision, operation or investment, they should consult an expert

⁵⁶ <https://www.oyez.org/cases/1995/94-1471>

before proceeding and document the expert's recommendations and comments, and why the recommendation was or was not followed.

Diversification Plan investments must be diversified in order to minimize the risk of large losses unless diversification is clearly imprudent.

Although the diversification requirement cannot be stated in terms of a fixed percentage or dollar amount, fiduciaries should generally refrain from investing disproportionately large amounts of the plan in a single security or a single type of security, or securities dependent upon the success of one enterprise or the conditions of one locality (i.e., must be geographically diverse, as well as diverse in types of investments and industries represented).

Factors to consider in determining whether the plan assets are diversified include: (1) the purpose of the plan; (2) the amount of plan assets; (3) financial and industrial conditions; (4) the type of investment; (5) geographical distribution; (6) distribution as to industries; and (7) dates of maturity.

Prohibited Transactions In addition to requiring that fiduciaries comply with specified standards when discharging their duties, ERISA precludes fiduciaries from engaging in various transactions unless an exemption applies.

1. **Party in Interest Transactions** ERISA § 406 prohibits a fiduciary from causing the plan to engage in a transaction with a party in interest that constitutes a direct or indirect transfer of goods, services, etc. between the party in interest and the plan.⁵⁷ "Party in interest" is defined broadly to include virtually all individuals who are related to the plan (i.e., fiduciaries, service providers, plan

⁵⁷ <https://www.law.cornell.edu/uscode/text/29/1106>

sponsors) and virtually all transactions between a plan and a party-in-interest are prohibited. Exemptions are available for a wide variety of party-in-interest transactions under ERISA § 408.⁵⁸

2. Self-Dealing Prohibitions A fiduciary may not engage in a transaction for his own benefit, in which he has a conflict of interest or in which he receives compensation from a third party.

Delegation of Fiduciary Duties ERISA fiduciaries may delegate fiduciary responsibility to a committee or a professional fiduciary (e.g., an investment manager). Thus, plan trustees may select an investment committee or asset manager and if proper procedures are followed, delegate to that person/committee authority to handle investments on behalf of the plan. However, the fiduciaries remain responsible for selecting and monitoring the performance of "outside" fiduciaries and service providers; *this "ultimate" fiduciary authority cannot be delegated away* (see *Lowen v. Tower Asset Management, Inc.*, 1987).⁵⁹

For example, Fiduciaries may delegate certain fiduciary duties to an investment manager. The following can assist fiduciaries in satisfying their duties to monitor the investment managers they retain:

1. Statement of Investment Policy According to the National Council of Non-Profits, fiduciaries should prepare a statement of investment policy and investment guidelines.⁶⁰ Examples of items contained in an investment policy are noted below:

- Plan objectives and goals.

⁵⁸ <https://www.law.cornell.edu/uscode/text/29/1108>

⁵⁹ <http://openjurist.org/829/f2d/1209/lowen-mm-v-tower-asset-management-inc-a-w-a-w>

⁶⁰ <https://www.councilofnonprofits.org/tools-resources/investment-policies-nonprofits>

- Investment performance benchmarks.
- Authorized asset classes and allocation restraints.
- Directed brokerage.
- Liquidity considerations.
- Minimum quality and duration limits (fixed income).
- Procedures for selecting or replacing investment funds.

2. Procedures for Selecting Investment Funds When selecting an investment fund, plan fiduciaries must follow prudent procedures. The DOL ERISA Advisory Council provided some guidance in 1996 on selecting investment funds in the form questions plan fiduciaries should ask when selecting investment funds in a report entitled "Guidance in Selecting and Monitoring Service Providers."⁶¹ Examples of questions plan fiduciaries should consider before retaining investment funds or money managers include:

- Does the fund company have the objective qualifications to provide investment services to the plan? For the specific investment style?
- What are the fees associated with the investment services? Are they reasonable compared to other investments?
- How does the fund company measure and report performance? Does the process ensure objective reporting?
- Has there been significant turnover in the fund's personnel or clients? Significant ownership changes of the fund company?

An investment consultant can assist fiduciaries in reviewing these items.

⁶¹ https://www.dol.gov/EBSA/regs/fedreg/meetings/96_17046.htm

Procedures for Monitoring Investment Funds In addition to the plan fiduciaries' duty to prudently select an investment fund, the fiduciaries must prudently monitor investment funds. Even though ERISA does not list specific procedures for monitoring investments, the DOL has provided guidance in its rulemaking (see *Master, Mates & Pilots Pension Plan and IRAP Litigation*, 1992).⁶² The DOL has identified the following items that the fiduciaries in that case were required to consider to comply with their fiduciary duties:

- Review, at least quarterly, each investment fund for compliance with its investment guidelines.
- Compare, at least quarterly, the investment results of each fund with appropriate indices or benchmarks.
- At least annually, review the investment fund's investment performance and any significant changes in corporate or capital structure, investment style, brokerage affiliation or practices, investment process and professional staff.
- Establish, and review at least annually, procedures for communicating information regarding investments and investment funds among the fiduciaries, the plan's staff, and the plan's service providers (including but not limited to the plan's attorneys and custodian).

Retaining an Investment Consultant An investment consultant can assist the fiduciaries in fulfilling their duty to monitor. The plan's contract with the investment consultant should obligate the consultant to perform the specific functions related to the duty to monitor.⁶³ The prudent person standard provides that a fiduciary will be judged according to the standards of others acting in a like capacity and familiar with investment

⁶² <http://law.justia.com/cases/federal/appellate-courts/F2/957/1020/2124/>

⁶³ <http://curciowebb.com/wp-content/uploads/2015/07/Tibble-Newsletter-6-12-15-Final.pdf>

matters. A fiduciary's lack of the requisite education, experience and skill does not excuse a trustee's negligence in ascertaining within a reasonable time whether the investment services are proper for the plan and the investment fees are reasonable (*Whitfield v. Cohen*, 1988).⁶⁴

The Fiduciary Standard for Public Pension Funds under State Law

This study focuses on Public Pension plans. The next section will review specific case matters unique to public pensions. Again, our aim is to understand how poor forms of governance can translate into significant funding and legal problems and the relationships thereof. An understanding of the general legal requirements of public pensions, especially in contrast to the other types of asset owners is important background, especially as we get into the development of a Legal Index later in the study.

More than \$3 trillion in assets are managed in the United States in retirement systems for public employees of state and local government. A mixture of state law governs these systems. In 1997 the Uniform Law Commissioners promulgated the Uniform Management of Public Employee Retirement Systems Act (UMPERSA) for the purpose of harmonizing the different sets of laws employed by the states. Unlike other uniform laws in this category, the Act has not been widely embraced with less than a handful of states adopting its provisions.⁶⁵

State and local governments are exempt from ERISA. No state has directly adopted ERISA provisions. However, because ERISA and state law protections both stem from

⁶⁴ <http://law.justia.com/cases/federal/district-courts/FSupp/682/188/1583488/>

⁶⁵ Uniform Law Commission, Management of Public Employee Retirement Systems Act Summary <http://www.uniformlaws.org/ActSummary.aspx?title=Management%20of%20Public%20Employee%20Retirement%20Systems%20Act>

common law fiduciary and trust principles, many public pension protections are similar to those found in ERISA. ERISA and state provisions concerning fiduciary standards of care and investment duties are similar. State law contains more rules, but ERISA-covered fiduciaries are subject to common law fiduciary rules and may therefore be subject to the rules found in the state statutes, but not expressed in ERISA.

Much of what states must adhere to in public fund management falls under the Uniform Prudent Investor Act (UPIA), which embodies the prudent investor rules and diversification principles of Modern Portfolio Theory (MPT), and was first promulgated in 1994. As of May 2004, the UPIA has been adopted in 44 States and the District of Columbia. Other states may have adopted parts of the Act, but not the entire Act. According to the National Conference of Commissioners on Uniform State Laws, the most common portion of the Act excluded by states concerns the delegation of investment decisions to qualified and supervised agents.⁶⁶ State law may provide oversight to the treasurer's investment decisions through an advisory board.

ERISA identifies many more prohibited fiduciary transactions than state law. ERISA does not require plan oversight, but subjects fiduciaries to lawsuits from interested parties, plan beneficiaries, and the federal government under certain circumstances. State law places few explicit limitations on the treasurer's investment ability. However, it limits her investment ability by stating affirmatively the transactions in which she may engage. ERISA also sets many more specific rules than state law does about loans to- and by plans and provision of goods, services, and facilities to the plan.

⁶⁶ Uniform Prudent Investor Act

Finally, ERISA places extensive reporting requirements on private-sector employers. State law is more limited requiring instead an Advisory Committee to annually report to the governor, state legislature, and plan beneficiaries on public pension security investments.

Below are common requirements of the treasurer (trustee) that will apply in most jurisdictions:

Fiduciary Standard of Care under the UPIA State law requires the treasurer to comply with the UPIA when making most types of investments. Under the UPIA, the treasurer must follow the following rules.

1. **Prudent investor rule** The treasurer must invest and manage pension fund assets as a prudent investor would, by considering the purposes, terms, distribution requirements, and other circumstances of the trust. In doing so she must exercise reasonable care, skill and caution. Her decisions about individual assets must be evaluated in the context of the trust portfolio as a whole and as a part of an overall investment strategy having risk and return objectives reasonably suited to the trust. Whether the treasurer complies with the prudent investor rule is determined in light of the facts and circumstances existing at the time of a particular decision.

2. **Factors the treasurer must consider when investing** While managing pension funds the treasurer must consider (a) general economic conditions; (b) the possible effect of inflation or deflation; (c) the expected tax consequences of investment decisions, strategies, and distributions; (d) the role that each investment or course of action plays within the overall trust portfolio; (e) the expected total return from income and the appreciation of capital; (f) needs for liquidity, for regularity of income and for preservation or appreciation of capital; (g) an asset's special

relationship or special value, if any, to the purpose of the trust or to one or more beneficiaries; (h) the portfolio size; and (i) the trust's nature and estimated duration.

3. Verification of facts The treasurer must take reasonable steps to verify facts relevant to the investment and management of trust assets.

4. Asset Diversification The treasurer must diversify the investments of the pension funds unless she reasonably determines that, because of special circumstances, the purposes of the trust are better served without diversifying.

5. Initial Asset Review The treasurer must review the trust assets within a reasonable time after accepting responsibility for the pension fund.

6. Loyalty The treasurer must invest and manage the pension funds solely in the interest of the beneficiaries.

7. Impartiality The treasurer must act impartially in investing and managing funds, taking into account any differing interests of the beneficiaries.

8. Investment costs The treasurer may only incur costs while investing and managing funds that are appropriate and reasonable in relation to the assets, the purposes of the trust, and the skills of the treasurer.

9. Delegating investment and management functions The treasurer may delegate investment and management functions that a prudent trustee of comparable skills could properly delegate under the circumstances. She must exercise reasonable care, skill, and caution in: (a) selecting an agent, (b) establishing

the scope and terms of the delegation consistent with the purposes and terms of the trust, and (c) periodically reviewing the agent's action in order to monitor his performance and compliance with the scope and terms of the delegation.

Investing Other Funds With regard to additional funds, state law requires the treasurer to invest trust deposit amounts in a reasonable and appropriate manner to achieve the objectives of the trust, exercising the discretion and care of a prudent person in similar circumstances with similar objectives.

Acting in Accordance with Plan Documents The treasurer must invest funds in a manner consistent with the objectives of the trust.

Oversight of the Fiduciary State law requires a statutorily created Investment Advisory Council or Investment Committee to review all investments that the treasurer makes and to recommend investment policies. The governor may direct the treasurer to change any investments she makes when the advisory council advises him that doing so is in the state's best interest.

Investment Duties For states, the rules are more limited. Treasurer need only invest funds that are not needed for current disbursement, and may consider social investing issues.

Loan Restrictions State law allows the treasurer to make loans to mortgage lenders subject to certain conditions. The treasurer may lend securities from funds under certain circumstances. The treasurer may receive loans on behalf of the state subject to the governor's approval.

Provisions of Goods, Services and Facilities by and to the Plan Unlike ERISA, there are no similar state provisions.

Liability for Breach of Fiduciary Duties Unlike ERISA, there are no similar state provisions.

Record Keeping and Reporting Unlike ERISA whose reporting requirements are extensive, the state requirements are modest in comparison. The Advisory Board may only have to report annually to the governor, the General Assembly, and beneficiaries on the pension's security investments.

The Fiduciary Standard for Non-Profit Institutional Funds under State Law

The **Uniform Prudent Management of Institutional Funds Act (UPMIFA)** is a uniform law that provides guidance on investment decisions and endowment expenditures for non-profit and charitable organizations. As of 2012, UPMIFA is now the law in the District of Columbia and all states.

The major change in UPMIFA compared to the previous model law (the Uniform Management of Institutional Funds Act or UMIFA) is that it replaces a antiquated requirement that non-profits cannot spend below the original value of contributions or “historic dollar value” (HDV) with a new requirement that their investing and spending will be at a rate that will preserve the purchasing power of the principal over the long term, e.g. university endowments. This provides more flexibility to organizations in determining their spending rates, even in the face of losses that may be temporarily market-driven.

The UPIA served as a model for many of the revisions. UPIA updates rules on investment decision making for trusts, including charitable trusts, and imposes additional

duties on trustees for the protection of beneficiaries. UPMIFA applies these rules and duties to charities organized as non-profit corporations. UPMIFA does not apply to trusts managed by corporate and other fiduciaries that are not charities, because UPIA provides management and investment standards for those trusts.

In applying principles based on UPIA to charities organized as non-profit corporations, UPMIFA combines the approaches taken by UPIA and by the Revised Model Nonprofit Corporation Act (RMNCA). UPMIFA reflects the fact that standards for managing and investing institutional funds are and should be the same regardless of whether a charitable organization is organized as a trust, a non-profit corporation, or some other entity.

According to the state of Ohio attorney general's interpretation of the Act, non-profit board members have four primary legal duties:⁶⁷

- Duty of Care
- Duty of Loyalty
- Duty of Compliance
- Duty to Maintain Accounts

Duty of Care The prudence standard in UPMIFA requires managers to meet their fiduciary duty of care, the duty to minimize costs, and the duty to investigate with respect to investment decision-making. In addition, UPMIFA directs managers of charities to consider general economic conditions, to make decisions on a portfolio basis, to allocate risk and return across the portfolio, and to consider the needs of the charity both to make

⁶⁷ *Guide for Charity Boardmembers*, by Attorney General Mike DeWine, <http://www.ohioattorneygeneral.gov/getattachment/9ca505a0-d926-4853-b4b7-aa7a03f68c13/Guide-for-Charity-Board-Members.aspx>

distributions and to preserve capital. A charity can pool funds for purposes of management and investment, and in some situations doing so can yield better investment results. Donor intent is an important component, so a charity must follow any specific donor directions for investment and management of assets. Of course, this emphasis on donor intent does not mean that a donor should have control of the management of a charity.

Duty of Loyalty The Act does not specifically state the duty of loyalty, but simply incorporates "the duty of loyalty imposed by law other than this Act." The drafters were concerned that different standards of loyalty might apply to non-profit directors and trustees of charitable trusts. As a result, the Act simply incorporates both standards by using the above quoted language. The duty of loyalty under non-profit corporation law applies to charities organized as non-profits, and the duty of loyalty under trust law applies to charitable trusts.

The difference between the two standards is slight. The duty of loyalty under non-profit corporation law says that a director or officer must act in a manner that he or she reasonably believes to be in the best interests of the organization. Trust law states that the trustee of a charitable trust must act in a manner that he or she reasonably believes to be in the sole interests of the trust beneficiaries. The basic idea is that the manager must consider the organization's or the trust beneficiary's interest as his or her own, and invest the funds in a way that protects those interests.

Duty of Compliance Board members must understand the charity's articles of incorporation, constitution, bylaws, codes of conduct, codes of ethics, and any other governing documents. They must be familiar with state and federal laws relating to nonprofit entities, fundraising, and tax-related issues as well as legal issues connected with the organization's charitable purposes and operations. Finally, they must comply with state

and federal registration and reporting requirements, including filings with the attorney general, the secretary of state, and the IRS.

A prudently constructed and monitored administration system should deliver comprehensive reporting on the performance of the institution's portfolio, simplify tax filings, provide reporting for the use of fiduciaries and donors alike and ensure the protection of the institution's assets.

Duty to Manage Accounts Organizations must develop policies and procedures that protect the organization's business interests and operations. They must develop annual budgets that provide clear direction for all organizational spending. The budget should be a blueprint of the board's program plans and should be routinely monitored, tracked throughout the year and revised as necessary. They must ensure maintenance of accurate records of all income, expenditures, transactions, and activities throughout the year — for the board and in all organizational operations. They must establish appropriate internal accounting systems, including checks and balances, so one staff member or volunteer does not have total control over finances, and so theft and improper spending can be identified quickly.

In addition they must:

- Prudently invest and reinvest assets.
- Develop fundraising goals and policies and assist the organization in acquiring resources for its programs.
- Make certain that fundraising appeals are presented honestly and fairly by monitoring the performance of fundraising professionals and volunteers.

- Insist upon getting the best value for goods and services through comparisons and an informed bidding process.
- Ensure board minutes are kept to indicate board approval of expenditures and investments and to show that informed discussions were held prior to approval of such transactions.

Breaches of Fiduciary Duty Trustees can be held individually responsible for breaches of fiduciary standards within a charity. For example, if charitable assets are sold at less than their fair market value, trustees may be held accountable for any shortfalls. Transactions involving conflicts of interest also can result in fiscal penalties. Criminal fraud charges can result when board members and key staff ignore their charitable obligations, and personally profit from assets that should be used for community purposes.

An Investigation into Legal Cases Common to Public Pensions

In general, the current macro-trend concerning legal cases common to pensions is consistent with one of the main observations from the introductory chapter, as explained by Paul Secunda in a 2014 *Michigan Law Article* review:

*Implementation of reforms, especially ones that either increase the financial burden on employees and/or retirees, or diminish the benefits that employees and/or retirees will receive, inevitably leads to protracted litigation.*⁶⁸

In that same article he reviews two recent high profile cases of how pension reform is happening throughout the legal system: 1) legislated (and litigated) pension reform in the state of Wisconsin; and 2) Chapter 9 municipal bankruptcy in the city of Detroit. He sees

⁶⁸ Secunda, Paul, "Litigating for the Future of Public Pensions", 2014 MICH. ST. L. REV. 1353, p. 1357

both cases as part of an “emerging trend in in public pension litigation currently playing out throughout the United States.”⁶⁹ In particular, he looks at the changes to the Wisconsin Retirement System that were made as part of the highly publicized Act 10 case in the State of Wisconsin, and were enacted in 2011 by Governor Scott Walker. As Secunda explains regarding this case:

The recently completed Wisconsin litigation, Madison Teachers, Inc. v. Walker, involved a provision that did not permit the City of Milwaukee to pay its employees’ pension contribution share. This case nicely illustrates some of the major constitutional arguments being advanced concerning whether such reform proposals are consistent with existing employee and retiree pension rights.⁷⁰

In contrast, in the Detroit bankruptcy case, these issues were left to a bankruptcy judge to sort through. Municipal bankruptcies due to pension obligations pose an interesting conflict between state constitutional law and federal bankruptcy law, and the notion of “cooperative federalism” that is being invoked in more and more of these cases. As Jack Beerman observes:

A decision that the Michigan Constitution prohibits the state’s municipalities from reducing their pension obligations in federal bankruptcy would not amount to a denial of the supremacy of federal law or be in the nature of state nullification of federal law. Rather, such a decision would be an example of the sort of cooperative federalism that has become increasingly common, under which federal law is optional.⁷¹

⁶⁹ *ibid*, p. 1358

⁷⁰ *ibid*, p. 1359

⁷¹ Beermann, Jack M., “Resolving the Public Pension ‘Crisis’”, *Fordham Urban Law Journal*, Volume 41, Issue 3 2015 Article 1, p. 1008

William Payne and Patrick Spangler in a 2012 legal brief describe in detail the litigation landscape for public pensions.⁷² They begin with the observation that since the 1960s state courts have turned from the earlier view that pension benefits were “gratuities” that could be decreased or eliminated in retirement to the present view that, like private pensions, public pensions are “contract rights”. They cite how several states, Illinois and New Mexico as examples, amended their constitutions to explicitly provide protection for public pensions as enforceable contract rights. They then list the common types of litigation, all of which involve some form of benefit reduction or increase in contributions:⁷³

- *Cost of living adjustment changes*
- *Increased contribution rates*
- *Changes in calculation of benefits or eligibility*
- *Retiree health contributions and benefits*

So, this covers the beneficiary litigation perspective of legal cases, but what about other fiduciary matters and conflicts? Kathleen Paisley in a 1985 article that appeared in the *Yale Law and Policy Review* called for the need for federal regulation of trustee investment decisions, a similar position that Secunda and others take when calling for a uniform set of laws for the states that are consistent with ERISA.⁷⁴ Paisley identifies two main duties of the trustees: 1) to act at all times with strict loyalty to participants and their beneficiaries; 2) administer the funds of the trust prudently. She cites the case of *Withers v. Teachers Retirement System*, which involved a decision by this New York pension board to purchase \$850 million of New York City municipal bonds. While in this case the court upheld the decision by the trustees, it was clear in examining the facts of the case the city would have

⁷² Payne, William T. and Spangler, Patrick W., “Public Employee Pension Litigation: Legal Landscape”, 012 ABA Mid-Winter Meeting – Breakout Session, p.1

⁷³ *ibid*, p. 7

⁷⁴ Paisley, Kathleen, “Public Pension Funds: The Need for Federal Regulation of Trustee Investment Decisions”, *Yale Law and Policy Review*, Vol. 4, Issue 1, Article 10, 1985

gone bankrupt were it not for this purchase. Paisely was critical of the court's decision stating "the court examined the merits of the individual investment decision without considering its effect on the trust's overall portfolio of assets".⁷⁵

In general, according to Robert A. Kutcher, common fiduciary breaches come in several forms:⁷⁶

- *Self-dealing (i.e., through conflict of interest or reaping of extra profits);*
- *Usurpation of business or corporate opportunity;*
- *Misappropriation of funds or property;*
- *Neglect, imprudence, or want of skill (e.g., failure to administer trust property as prudent administrator, failure to properly diversify ERISA plan investments, or improper reliance on professionals);*
- *Failure to act in another's best interest;*
- *Misrepresentation/omission as to a statement of fact (e.g., financial condition/statement of affairs);*
- *Inducement;*
- *Breach of an assumed duty (e.g., to provide accurate information);*
- *Misuse of confidential information/breach of confidentiality;*
- *Misuse of superior knowledge;*
- *Failure to disclose;*
- *Aiding and abetting or acting in concert with another rendering inappropriate advice (e.g., bad business or investment advice); and*
- *Misuse of superior or influential position*

⁷⁵ *ibid*, p. 193-194

⁷⁶ Kutcher, Robert A., "Breach of Fiduciary Duties", *Business Torts Litigation, Second Edition*, American Bar Association, 2005, p. 11, David A. Soley, Robert Y. Gwin, and Ann E. Georgehead, editors

In terms of understanding or evaluating the severity of a breach within the context of ERISA plans, Eric Chason explain the Supreme Court’s view on this:⁷⁷

An ERISA fiduciary who harms or abuses plan assets (e.g., by negligent investing) must make the plan whole by paying either damages or restitution. Trust beneficiaries may seek similar redress for breach of trust. Yet, unlike trust law, ERISA imposes fiduciary duties extending beyond the management and distribution of property. ERISA fiduciaries have discretion to pay or deny claims for benefits, and a wrongful denial of benefits can devastate an employee and her covered dependents. Fiduciary breaches that harm plan assets warrant full relief. Breaches that do not harm plan assets warrant only “appropriate equitable relief,” which excludes most forms of monetary relief according to the Court.

While we are focused on public pension assets, we cross-apply this general “doctrine of harm” from ERISA to evaluate the various types of cases based on their harms. As will be further analyzed in Chapter VI we have constructed a severity variable that categorizes seven case types found in the data we collected on public pension plans, ranging from the most harmful, fraud, to the least harmful, minor statutory duties regarding operations. A final category of filed, but unknown cases was also included. The details of every case, often depending on the early stages of a case, are not always known. See **Table 1.**

⁷⁷ Chason, Eric D., “Redressing All ERISA Fiduciary Breaches Under Section 409 (a)”, *William & Mary Law School Scholarship Repository*, College of William and Mary Law School, 2010, p. 148

Table 1 – Severity Scale for Public Pension Legal Cases

- 1 Concerning investments: frauds
- 2 Concerning investments: breaking agreements/duties
- 3 Concerning benefit management/disbursement
- 4 Concerning plan practical operations
- 5 Concerning minor statutory duties regarding operations
- 6 Concerning alterior investment concerns
- 7 Unknown cases

With inherent legal conflicts existing between governments, plans and retirees, and between states and federal law as backdrop, some discussion on the current forms of legal process in addressing the public pension funding problems, and the typical forms of fiduciary breeches, we now turn to a review of the case data we collected and its purpose.

The legal data collected in this study was to find out: 1) what specific cases are happening on the ground? 2) Is there a trend in the number or types of cases occurring? And, 3) what relationship, if any, do these legal cases have to asset owner governance? We categorize the legal environment for fiduciary problems concerning public pension governance across three major categories: Civil, Criminal and Regulatory.

While we were able to find detailed information about cases in the courts using Bloomberg law, there were limited regulatory action cases. This was not surprising as most federal regulatory agencies, including the SEC, and self-regulatory organizations (SROs),

such as FINRA, do not have any jurisdiction over state and municipal pension funds. In our data set we found 10 SEC cases that primarily dealt with corporate disclosure matters.

Even with insurance regulated at the state level, and the extensive use of investment products provided by the insurance industry, there was no evidence of any claims or disputes filed with the Offices of the Insurance Commission for any of the public plans in our sample. Likewise, there were no criminal cases found.

Some individual cases directly draw into question the effectiveness of the administration, as in a state of Michigan supreme court case concerning unions during the study period: Why was there a need to boost contribution levels 3% from employees? Was this due to escalating health care costs, poor governance or management of the investments or due to budgetary problems in relation to the pension scheme (or all of the above)? According to the *Detroit Free Press*, the 2010 state law that permitted that increase in contributions, and was later found unconstitutional, was confirmed on appeal again in June of 2016, as the court ruled again in favor of the Michigan school employees because the benefits were not guaranteed to employees.⁷⁸

The largest frequency of civil cases involved Denial of Benefit Claims at 51%. These are cases where a beneficiary files suit against the plan to dispute the amount of benefits being paid out or because they were denied. The growing number of these cases is consistent with Secunda's initial observation at the beginning of this section.

Second in order were SEC claims at 23%. These are cases where there was alleged improper reporting or outright fraud by an issuing company, and the pension fund enjoined litigation against the company as a shareholder of the security. One example is the case of *Amgen Inc. v. Connecticut Retirement Plans and Trust Funds* for securities fraud. The action centered on alleged misrepresentations and omissions made by Amgen on two of its

⁷⁸ Egan, Paul, "Appeals court rules for school employees on 3% refund", *Detroit Free Press*, June 7, 2016

flagship products Aranesp and Epogen, both cancer drugs, and the case concerned primarily product safety, and went to the U.S. Supreme Court on appeal.⁷⁹ This was affirmed by the court in a split decision that proof of materiality is not a prerequisite to certification of a securities-fraud class action seeking money damages for alleged violations of Securities and Exchange Commission Rule #10(b) and Rule 1.

These cases seen in the data are recognizable from the headlines, with several directly related to the Financial Crisis, and are primarily Rule 10B-5 or Section 20(a) actions: Toyota's large recall of vehicles for sticky acceleration pedals; Fannie Mae when drawn into bankruptcy / conservatorship in the summer of 2008; and Washington Mutual's bankruptcy are examples present in the data among others.

The last quarter of cases include Gross Negligence, Civil Rights Violation, Constitutional Challenge, Contract, Creditor, Fraudulent Conveyance, Garnishment of Wages, Personal Injury, Probate, Qualified Domestic Relations Order (QDRO) and Wrongful Termination. Note that half of these are similar to the Denial of Benefit claims in that the purpose of the claim is to recover property and concerns a question regarding rights to that property i.e., Fraudulent Conveyance, Garnishment of Wages, QDRO, Wrongful Termination and Probate.

This data, combined with other plan governance data and analytics, should offer opportunities to further understand the legal and societal impact of public pension plans. From an effectiveness perspective, analysis of funding ratios and performance statistics provide the barometers of how the pension fund is performing, but the legal and regulatory cases that arise over time as a result of this performance have the potential to inform us on the magnitude of the impact of this performance on society itself. Lower levels of

⁷⁹ <http://www.scotusblog.com/case-files/cases/amgen-inc-v-connecticut-retirement-plans-and-trust-funds/>

performance (i.e., ineffectiveness) over time necessitate either an increase in contributions, which impact taxpayers and employees, or reductions in benefits, which impact retirees.

An overlay of legal analysis allows us to monitor how this tension plays out as people turn to the judicial system to address a retirement system that over time is less able to meet its commitments without further burdening one group at the expense of another. The case severity scale for categorizing and scoring is the proposed tool for integrating this information into a broader fund governance model as will be further developed in Chapter VI.

CHAPTER III
GOVERNANCE AND ORGANIZATIONAL EFFECTIVENESS

Introduction

This study focuses on the governance or fiduciary effectiveness of asset owners, and specifically public pension plans. To understand the dynamics, challenges and opportunities for these organizations, and have a basis for developing a system of effectiveness measures, it is necessary to have a thorough understanding of governance and organizational effectiveness from an interdisciplinary perspective. This means reviewing governance theory through the lenses of the law, as we just did, social psychology and organizational behavior, ethics, finance and economics.

The next two chapters will review theory, research and the literature for the purpose of narrowing our field of factors for examination in applying corporate governance methods to institutional fund evaluation, and specifically for public pension funds. This chapter will review organizational governance theory in general, and Chapter IV will look specifically at body of work in the field of public pension and asset owner governance. Each section will have a concluding segment entitled “Implications for Pension Board Governance Factors”. This will form the basis of the factors that were selected and analyzed in Chapter VI.

Group effectiveness is a topic of ongoing interest in the management field. How effective organizations operate, ranging from small teams to large corporations, is a field of inquiry that is virtually endless in its theories and case examinations. My narrow field of study, of course, looks at one particular type of group: a group of financial governance fiduciaries, the investment committee (or board) of public pension funds.

The record of effectiveness of these groups is mixed at best. One common measure of effectiveness is the rate of return performance. Looking only at public pensions over the 2008 to 2012 study period, the range of annualized returns across the entire population was -0.9% to 15%.⁸⁰ Even accounting for differences in asset allocation and investment objectives, these results show enormous disparity in performance, and on a dollar basis potentially represent an opportunity cost in the billions. What is it about these groups, and the individuals that comprise them, that can drive such varying results across such a large group? The answer lies in how these groups organize (governance structure), the people that reside on the boards and committees of these organizations (human factors) and how they interact with each other and the investment consultants and managers with whom they work (group processes).

A 2001 U.K. government report, known as the Myners Report, concluded that one problem is that 'many trustees are not especially expert in investment'.

To illustrate this finding, the Report observed a majority of trustees had no professional qualifications in finance or investment, had little in the way of initial training, did not attend training courses after the first 12 months of appointment, and spent hardly any time in the course of a week preparing for pension fund investment decisions. Pension fund trustees may be well intentioned but there is no 'legal requirement for trustees to have any particular level of expertise in investment matters'.⁸¹

In the next few sections, we will highlight earlier research that shows institutional norms, practices and rules can have a positive effect on collective decision-making. This study questions whether institutional factors are sufficient to overcome the issues

⁸⁰ Public Plans Database, Center for Retirement Research, Boston College <http://crr.bc.edu/data/public-plans-database/>

⁸¹ Clark, Gordon L., Caerlewy-Smith, Emiko, and Marshall, John C., "Pension Fund Competence: Decision Making in Problems Relevant to Investment Practice", Cambridge University Press, March, 2006, p. 4

associated with heterogeneity of trustee competence. Given the frailties of human beings, we examine whether there are common governance factors that can mitigate these effects such as the use of outside consultants (people with formal training in investments), and board turnover (duration of engagement and consistency of collective experience). If these factors can be linked to better performance measures, this may provide some positive new directions for public policy.

Examining Group Performance and Decision-Making

When assessing governance fiduciaries (trustees), this section draws from a 2006 study of pension fund trustees by Clark, Caerlewy-Smith and Marshall. The study specifically looks into pension fund trustee competence. The authors indicated that while there had been a significant amount of research done on individual decision-making, up until this point there had been very few studies specific to trustee decision-making.

The study considers trustee problem-solving skills with regard to investments and, in particular, their discount functions, their willingness to take risks with their own money and other people's money, their understanding of probability, and their efficiency in processing information.

The survey was designed to examine widely recognized problems drawn from the psychology literature, and drew from a number of established tests and techniques:

Problems relevant to investment decision-making...each problem is linked to the relevant literature...Where possible, the same problem was set in two different ways so as to test the consistency of respondents' solutions...Care was taken throughout to present the problems in simple ways using common vernacular...⁸²

⁸² *ibid*, p. 10

Study Highlights The conclusions drawn from the experimental study found several shortcomings that suggest pension trustees are no better than members of the broader population in overcoming common cognitive biases as documented in the literature:⁸³

- 1) Trustees generally have shallow and non-exponential discount functions. As a group, it is nearly impossible to define a simple function. This implies that trustees do not evaluate consistently the time value of money within the context of inherent conditions of uncertainty and risk.
- 2) Trustees in general responded that they would assume a moderate amount of risk. However, in measuring implicit risk preferences it was found that individuals are risk averse (loss averse).
- 3) Trustees are ill-equipped to make probability estimates. Without training, people do not typically understand the steps necessary for calculating probabilities.
- 4) Finally, trustees are subject to confirmation bias, selecting information to confirm pre-suppositions, and do not use available data efficiently to test solutions to problems.

Implications for Pension Board Governance Factors: What role do investment professionals including both outside consultants and internal staff have in improving the fiduciary effectiveness of pension plans given concerns about trustee competence? What about board and committee leadership? Training and education could also play a role.

⁸³ *ibid*, p. 22

Boards in Concept

Leadership theory runs swift and deep, the river banks crowded with animated commentators and interested observers. Governance theory trickles along the shallower backwaters; it attracts little notice and even fewer devotees (Chait, Ryan & Taylor, 2005).⁸⁴

Chait, Ryan & Taylor's observation may be true when looking at governance theory through the lens of social psychology, however when examining this topic through the financial and legal disciplines, a different picture emerges, more like a flood than a trickle. The last fifteen years have witnessed heightened attention that could be ascribed to two main periods of corporate and financial dysfunction: 1) the wave of accounting scandals of the early 2000s; and 2) the 2008 Global Financial Crisis (GFC).

Both periods elicited deep and expansive legislative and regulatory response, first in the form of the Sarbanes-Oxley Act of 2002 (SOX) and later in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank). Many point to the failure of boardroom governance, starting with Enron in 2001, as the main culprit in destroying trillions of dollars of shareholder wealth, and particularly in the latter case, bringing the global economy to the brink (Fortuna & Loch, 2012).

While corporate governance (CG) has clearly received the most interest both by mainstream media and academia, other areas of governance across American society are also receiving some attention, ranging from school districts to pension funds. Public sector and non-profit organizations are facing their own range of challenges from a governance perspective, and further research into these areas, with information sharing across multiple disciplines, is needed.

⁸⁴ Quoted from Adamson, 2011

One such opportunity is in the area of organizational dynamics. Boards and their related committee structures are unique organizational forms. Their power is significant, and is wielded across virtually the entire range of corporations and non-profits organizations, and many state and municipal agencies. Yet, with the exception of certain public sector boards that must go on the record and be open to the public, their transparency is generally quite limited.

Boards are, in effect, black boxes, where there is an effect of “outward appearance, and inward decisions” (Barratt and Korac-Kakabadse, 2013). Academic research has primarily focused on board structure, but evidence is gathering that “structure and board composition are not good predictors of good governance...there is a need to broaden the board performance measures in use”. The focus is shifting over to processes, instead of structural aspects alone, despite the obstacles to gaining access to the “live boardroom” (ibid).

The discipline and research methods of organizational dynamics may offer the tools to help fill in the gaps of our current understanding of board effectiveness. This understanding and how it may apply to improving our systems of governance have a number of public policy implications such as improved governance practices and greater accountability.

This section explores the topic of board governance effectiveness, and current theories and practices around assessment. After reviewing the current background of board governance and board effectiveness, later on in Chapter V on Methodology, we will examine certain communications research methods of organizational dynamics that may offer the potential to “open the black box” of governance processes and behaviors to enhance the methods for board governance evaluation. We will draw some preliminary conclusions, and discuss current and future research on this topic, specifically as it relates to research of

investment boards and committees, e.g. public and private pensions, foundations, endowments and trusts.

A board, and its related committee structures, is a unique species among organizations. Boards govern a range of organizations with varying mandates and motivations: for-profit, special purpose, philanthropic and/or community-minded. They may represent or balance the interests of a narrow and limited, or broad and diverse, body of stakeholders. They typically meet with relative infrequency, perhaps no more than three to six times a year, so the level of contact among members may be limited.⁸⁵ In certain cases, there may even be legal restrictions that limit board member contact outside of the public board meeting as, for example, required by the Brown Act in California for public school districts (Mar, 2011).

The economics and incentive forms vary: some members may be volunteers or receive some form of compensation. In the case of public company boards, the issue of compensation structure may be a key factor in aligning interests with shareholders. The process governing selection is inherently political; some are appointed while others are elected.⁸⁶ The nomination process, especially in the case of public pensions, can be highly politicized, with byzantine rules governing the selection of members including combined nomination and confirmation processes through the governor, state legislature and public unions. In the case of public corporations, takeover bids and expensive proxy fights are waged to influence the slate of directors and board actions.

Member retention can, in certain circumstances, be tenuous at best with high turnover rates. For example, 45 percent of school district board members in the state of Indiana serve only for one full, four-year term (Adamson, 2011). Lack of experience and consistency in membership has obvious implications for board effectiveness with the

⁸⁵ <https://www.quora.com/Corporate-Governance-How-often-does-the-Board-of-Directors-of-a-public-tech-company-meet>

⁸⁶ <http://www.nytimes.com/1988/11/06/nyregion/school-boards-elected-or-appointed.html?pagewanted=all>

insufficient institutional knowledge present among the boards. By comparison in our own data set, we noted that turnover rates among public pension boards on average were approximately 20% per year, which means that board members in aggregate typically serve no more than 5 years.

Many board members have inadequate training or background experience to operate at the level required of a board. In the state of California, to serve on a school district board, the only single requirement is that the member be at least 18 years of age (Mar, 2011). Less than half of board members in the state of Indiana receive any training (Adamson, 2011). Similarly, public pensions, the focus of my research, have limited requirements for board members (Clark, Caerlewy-Smith & Marshall, 2006). In that study, they reference the findings from the Myner's Report, noting that "a majority of trustees had no professional qualifications in finance or investment, had little initial training, did not attend training courses after the first 12 months of appointment, and spent little time in the course of a week preparing for pension fund investment decisions."⁸⁷

Board Governance Governing boards in any setting are composed of the following elements: organizational structure, people, processes/behaviors and tasks/functions. They are charged with the following responsibilities: a monitoring or oversight role, typically of management and executive staff; decision-making power for policy formulation, strategy determination and allocation of resources; and they are bound by fiduciary duties, namely, the duty of care and the duty of loyalty.

Since the early 1930s, corporate governance theory has focused on four structural foundations: Agency theory, management theory, stakeholder theory and stewardship theory (Fortuna & Loch, 2012). These theories have focused on explaining the complex, interconnected relationships between the board, management, shareholders, and other

⁸⁷ Clark, Gordon L., Caerlewy-Smith, Emiko, and Marshall, John C., "Pension Fund Competence: Decision Making in Problems Relevant to Investment Practice", Cambridge University Press, March, 2006, p. 4

stakeholders. The main bone of contention has been centered on the separation of ownership from control, the agency problem of shareholders versus management, and the potential misappropriation of wealth by management. Over the years, this concern has expanded to other stakeholders including customers, employees, creditors, the government and the community at large, and the impact the corporation can have on each constituency, whether economic, environmental or social. Management – especially CEO – compensation and societal (economic and environmental) impacts have been particularly controversial subjects.

While the structural and normative framework for corporate governance has been adequately covered and understood in the literature, what has only begun receiving attention in recent years is this notion of penetrating the black box of corporate governance to understand what transpires within the boardroom itself – how and why decisions are made. Furthermore, linking this to a proper and thorough understanding of governance effectiveness is the final step in making any inquiry into this subject worthwhile. Making the boardroom accessible is where organizational dynamics may offer some promise in the field:

To answer the how (sic) to prevent these financial crises, the literature review focus needed to shift to what transpires within the boardroom culture in order to understand how and why decisions are made. Two details were immediately discovered. First, behavioral elements in the success of corporate governance and its actors had been noted in past publications, but limited empirical studies addressing this phenomena (sic) exist. The second discovery was that boardrooms with their key actors beliefs, values, and inferred behaviors have their own discrete organizational cultures. (Ibid)

What Makes for an Effective Board?

Industry is crowded with many opinions about what ingredients are needed for effective boards. A brief web search will bring up not just academic papers on governance, but the briefs and articles of many consultancies, proxy advisors and accounting firms that offer advice and services in this area. Giving advice, especially to financial intermediaries and investors, on the business of governance is big business.

Corporations It's important to note that while public pension boards are non-profit, in that they are charged with maximizing beneficiary returns, they are like corporate boards that are charged with maximizing shareholder returns. Thus, the characteristics of effective corporate boards are likely to be relevant for pension boards.

On page 5 of the Conference Board's 1998 report, "Determining Board Effectiveness", there are five key questions that provide a framework for assessing the effectiveness of corporate boards:

- *What standards and metrics are appropriate for assessing the effectiveness of the board?*
- *What impact does the board's infrastructure have on its effectiveness?*
- *How does the composition of the board relate to its effectiveness?*
- *How does the board evaluate itself either collectively or individually?*
- *How does the board go about making necessary changes in strategy, structure and processes to improve its effectiveness?*

John & Senbet (1998) describe how the effectiveness of the corporate board is driven by several structural elements: its independence and composition, size, committee structure and compensation structure. Independence and composition of the board simply mean that the board members are not all employees of the company, and this, of course,

establishes a group to oversee management that is not conflicted in the sense of overseeing themselves. It also calls for the independence and separation of the two roles of chairperson and CEO.

The one downside, as pointed out in the literature, is that independent, outside directors may not have access to all of the necessary information, or the time or inclination to review it, to make effective decisions (Schaffer, 2002). So, the most effective boards will have a mix of internal and external board members, and then see, especially in certain committees such as audit, where absence of any conflict is key, that the composition of the committee is purely independent.

Empirical studies have shown that smaller boards are more effective, and that relationship declines as board size increases from four to ten members. Beyond ten no relationship appears to exist looking at the dependent variables of valuation and profitability in relation to the independent variable of board size (John & Senbet, 1998). The Ringelmann Effect (also known as Social Loafing) may be at play when groups become too large to be effective (Latané & Harkins, 1979).

Klein (1995) researches the impact of the committee structure of boards and the role of directors within the committees on the effectiveness of the board. Committees should be organized with specialized roles to enhance the board's performance in both its productivity and monitoring functions. Each committee should be set up with a defined set of functions and goals, and be staffed with directors most likely to attain each goal. Common committee structures follow this framework: governance/nominating, audit, compensation, strategy, finance (investments/capital budgeting) and other *ad hoc* committees.

Committees exist to do the work of the board within a task-specific area. They are used to facilitate, evaluate and ratify long-term investment decisions and to monitor the performance of senior management. One would expect productivity-oriented committees to

be staffed by insiders and monitoring-oriented committees by outsiders. This is, in fact, how many boards arrange themselves, and research has found a positive relationship between a higher percentage of outsiders involved in the monitoring function and improved performance results of the firm (Klein, 1995).

Board of director compensation structure is important for aligning interests of the board with those of shareholders (e.g. stock ownership). Agency theorists assert that effective monitoring is a function of a board's incentives (Hillman & Dalziel, 2003). Boards are also responsible for hiring the CEO and other top management, and structuring management compensation. The compensation issue has drawn much ire in recent years as the pay packages of CEOs have become increasingly larger, in many cases despite retention or turnover. It has been a hot button issue, and "say on pay" rights of shareholders have recently been under scrutiny.

Non-profits Bridgestar in 2009 published a brief article outlining the keys to becoming a more effective non-profit board, paraphrased here:

1. Need for improved oversight due to increased regulatory scrutiny
2. Leadership activities: strategic support and expertise, raising funds, building community support, and goal and task prioritization.
3. The right board processes: people, culture, decision-making processes and structures
4. Understanding and executing on areas that need strengthening
5. Self-assessments

Public Sector For school district boards, which can be extended to other government municipalities and agencies, effective governance teams must provide leadership based on needs and community values as well as provide fiscal viability. The primary attributes of effective governance teams include (Mar, 2011):

1. Ability to set priorities
2. Ability to maintain the districts and schools
3. Ability to determine effective agendas, make sound decisions and exercise good political judgment

Furthermore, Mar (2011), elaborates on the specific elements and strategies of effective boards in this area:

1. Respect for differing opinions to promote open and effective communication
2. Strategies to promote unity, and manage conflict
3. Effective superintendent-board partnerships
4. Governance team training

So, if these are the attributes of effective governance across the range of sectors: corporate, non-profit and governmental, let's drill into the specific elements of structure and process/behaviors in many ways common to all three.

Group process and behaviors *Extensive research has been completed on corporate governance. The related empirical studies have generated ambiguous and confusing results, which have inspired calls for new alternatives to board and governance research. These appeals have generated numerous articles expressing the necessity for studies that define behavioral processes inside and outside the boardroom for a clearer understanding of what is effective governance. (Fortuna & Loch, 2011)*

Surprisingly, despite this clarion call to CG scholars, the vanguard of behavioral research is not on the frontlines of corporate America, but in the backwaters of school district board governance.

Mar (2011) states the problem:

The governance structure of school boards requires that decisions be reached as a multi-member team. While the goal is to reach consensus, effective decision-

making often involves conflict or disagreement that allows for diverse perspectives. The challenge is for governance to allow for such diversity without erupting into unproductive and damaging conflict. Decision-making can be problematic for any group. Individual members may have a desire to conform to group expectations, causing groups to overlook viable choices in favor of an unrealistic alternative, termed groupthink. Defensive avoidance, the suppression of differences, can occur in groups unable to handle conflict. Status seeking can cause individuals to attempt to dominate the group, resulting in dissatisfaction and unproductiveness. Miscommunication interferes with group decision making, adding an emotional aspect. Group members often have different values that result in internal conflict. (Mar, 2011)

Fortuna & Loch, in their groundbreaking 2012 article, identified key attributes of corporate boards from a behavioral perspective. They assembled these attributes into two categories, positive and negative. Positive group beliefs and values included: collaboration, collegiality, respect and cognitive diversity. Negative attributes included: combativeness, dysfunction, disrespect, and cosmetic diversity.

Mar (2011) applies team-based models in assessing board effectiveness. In particular she references Bales & Strodtbeck's (1951) model that is based on problems concerning orientation, evaluation and control. The model focuses on socio-emotional responses that produce positive or negative interdependence, and ultimately the group's ability to perform.

Mar operates under the theory that successful boards must develop both task skills and relationship skills in order to collaborate successfully. For that she applies the Team Development Matrix, developed by Jones and Beardley (2001), a two-dimensional model that correlates task and relationship behavior to examine group development stages.

A group that is well established over time may lose sight over how the group is working together. This lack of relationship-focus can impede the ability of the group to work together and complete tasks. Both must be functioning, and functioning well for overall effectiveness. The stages of process behavior include: dependency, conflict, cohesion and interdependence. Task behavior stages include: orientation, organization, open data flow and problem solving. See **Table 2**, the Team Development Matrix, for further information.

*Measuring the success of teams through task accomplishment alone is insufficient...Effective groups understand that they must develop relationships that foster trust and mutual feedback, in addition to establishing a clear focus on goals.
(Mar, 2011)*

Table 2 - Team Development Matrix⁸⁸

Interdependence	"Flying Circus", free expression of feelings	Flexibility, negotiation	Supportive, good communication	Collaboration, shared decision- making, camaraderie
Cohesion	Tightly knit, "we-ness"	Harmony, Cooperation	Sharing, dialogue trust	Ownership, safety
Conflict	Resistance, leadership struggle, disagreement	Fractionation reactive, disagreements	Encounter task- oriented confrontation	Issue-oriented polarization
Dependency	"Square 1" coping with newness	Inefficiency, search for procedures	Telling-asking, one-way communication	Experting, leader-centered decision- making
<i>Relationship Behavior / Task Behavior</i>	Orientation	Organization	Open Data Flow	Problem Solving

The Team Development Matrix is a helpful model in conceptualizing and understanding the development stages of teams, and where there may be problems and challenges because it relates both relationship behaviors with task behaviors. Most

⁸⁸ Team Development Matrix. From "Facilitating Team Development: A View from the Field," by J.E. Jones and W.L. Beardley, 2001.

importantly, these behaviors are observable in the group setting, so that a researcher, who has access to the boardroom, has the tools to determine and identify the level of effectiveness of the board from a behavioral standpoint.

This has been a review of the perspectives of effective board governance, in both theory and practice. We reviewed the determinants of board governance across the spectrum of corporate, non-profit and public sector boards. In particular, we addressed the current state of knowledge and the present call for a new approach to a better understanding of effective governance by looking at boards from the inside out. This entails looking at governance phenomena beyond organizational structure, the traditional focus of CG research, and also the role of processes, relationships and culture to gain a more comprehensive understanding of what constitutes effective board governance. We discussed how team-based models may be applied from a theoretical perspective, and referenced in particular Jones & Beardley's (2001) Team Development Matrix model.

Implications for Pension Board Governance Factors: There are numerous questions and implications from this section for governance factors:

- How engaged is the board, and how can the level of engagement be measured?
- Who serves in what capacity? Is there cross-over between committees? Which committees?
- How large is the board, and what kind of continuity exists (i.e. turnover) among its members, including its leadership?
- How is the board / committee spending its time and on what issues? (e.g. type and substance of discussion).
- Who serves on the board? Are they elected or appointed? Who attends the meetings? How often?

- Does the board engage in self-assessment? How does it report on its meeting?
What level of transparency exists?
- Professional background, expertise and training among members.
- The role and level of compensation.
- The role and level of diversity.
- Staff / insider participation balanced with independence among certain members and committees.
- Finally, what factors are readily accessible, and might there be proxies for certain information that can be obtained? For example, is the duration of meetings a good proxy for careful deliberation, an important process attribute?

Human Error in Asset Owner Governance

Those who manage university endowments have at their disposal some of the finest scholars, and university trustees who are drawn from the highest ranks of the business world. Who would presume to call these people foolish? But, that is what one would apparently have to do if one wishes to attribute the market behavior to human error.

— **Robert Shiller, “Bubbles, Human Judgment and Expert Opinion”⁸⁹**

What is human error? Human error means that something has been done that was "not intended by the actor; not desired by a set of rules or an external observer; or that led the task or system outside its acceptable limits" (Senders and Moray, 1991). In short, it is a deviation from intention, expectation or desirability. Logically, human actions can fail to

⁸⁹ Shiller, Robert, "Bubbles, Human Judgment and Expert Opinion", Cowles Foundation Discussion Paper No. 1303, May 2001, p. 2

achieve their goal in two different ways: the actions can go as planned, but the plan can be inadequate, leading to mistakes; or, the plan can be satisfactory, but the performance can be deficient, leading to slips and lapses (Hollnagel, 1993). However, a mere failure is not an error if there had been no plan to accomplish something in particular.

Guastello (2014) further identifies five common types of human error:

- Errors of commission – these are the most obvious, where the operator takes the wrong action.
- Errors of omission – this is where the operator neglects to take the right action.
- Extraneous acts – the operator takes an action, when doing nothing would have been the preferred course.
- Sequential errors – the operator takes perhaps the right action, in the wrong order.
- Timing errors – the operator takes the right action, but at the wrong time.

I would add one to the list, particularly in competitive situations, the so-called “unforced error”, as typically described in tennis.⁹⁰ This is where a loss on the court results only from one’s own blunder and not from the skill or action of the other player. This is relevant especially when considered in the context of the zero-sum game of securities trading, where every dollar “won” by one trader must be lost by another.⁹¹

⁹⁰ Krames, Jeffrey A., *The Unforced Error: Why Some Managers Get Promoted While Others Get Eliminated*, Portfolio, 2009

⁹¹ http://247wallst.com/investing/2007/03/08/why_trading_is_/

In investment management, where risk management is a central concept, human error in practice is most narrowly defined as “operational risk”. According to KPMG, operational risk in banks, funds and insurance companies is:⁹²

Defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk.

As an example, in 2001 the State of Wisconsin Investment Board (SWIB), made a clerical error in a performance calculation that cost the pension approximately \$4.5 million when determining a payout to the Milwaukee Public School system’s supplemental early retirement plan. In this case, a simple decimal error was the culprit. The board told the pension plan administrator that the February 2001 all-stock variable return was negative 0.089%, when it was actually negative 8.90%, and the return for the fixed fund, which contained a stock and bond mix, was negative 0.046%, when it was actually negative 4.60%.⁹³

According to the state board’s former chief operating officer, Ken Johnson, “It wasn’t the technology that wasn’t performing correctly, it was a case of human error. The decimal point was put in the wrong spot when the person read the return off the report - the number e-mailed [was wrong].”

While operational risk is a simple concept to understand, the behavioral finance literature has focused on another form of risk (behavioral risk) to explain irrationality in financial decision-making, a subject we will elaborate on in a later section.

⁹² <https://www.kpmg.com/lu/en/services/advisory/risk-consulting/financialregulatoryreporting/documents/operational-risk.pdf>

⁹³ <http://www.globalaging.org/pension/us/socialsec/milwaukeeplan.htm>

Behavioral finance is a relatively new field that seeks to combine behavioral and cognitive psychological theory with conventional economics and finance to provide explanations for why people make irrational financial decisions

(Investopedia).⁹⁴

These two forms of error present in investment management, operational risk and behavioral risk or error in human decision-making, are very different forms of error. As will become clear by the end of this paper, one is very functional in form, and the other is more strategic. Operational risk can be more easily controlled and safeguarded against through audits, procedures and practices; Behavioral Risk is more subjective, ambiguous and difficult to judge in practice, and requires structural and process adjustments to limit it. See **Table 3** for a summary.

Table 3 - Two Forms of Human Error in Investment Management

	Form	Safeguard
Operational Risk	Discrete	Procedural / system enhancement
Behavioral Risk	Continuous	Governance structure / process enhancement

Finally, there is, of course, a range of tolerance for human error in human affairs. This largely depends whether there is a “second chance” attribute, an opportunity to recover from the error. The examples of zero tolerance in human error are countless,

⁹⁴ http://www.investopedia.com/university/behavioral_finance/

mostly where human life is at stake: surgery, nuclear power, air travel, heavy construction, etc. Of course, the financial and reputational cost are also of major importance.

Todd and Walsh (2013) describe common oversight mistakes of pension committees. Oversight of plan investments is a fundamental duty of governance committees.

- **Focusing on investment manager selection over the asset allocation decision.**

They reference investment research such as the 1995 Brinson, Hood & Beebower study, which assert that investment outcomes are as much as 90% determined by the asset allocation decision, making this the primary lever by which investors can impact long-term performance. Their admonition is that many committees get bogged down in a “this versus that” manager discussion, and lose sight of the bigger picture.

- **Not focusing on plan liabilities.** Plan sponsors can fall into the trap of not forming investment policy in light of long-term liabilities. The interplay of liabilities and time horizon are important considerations when making the asset allocation decision. An allocation that doesn’t tolerate short term volatility in asset classes such as equity and alternatives, may undermine the ability of the investment pool to meet liability payments in the future without significant additional contributions by the sponsor to make up the shortfall.

- **Backward looking bias.** The section on Behavioral Finance will provide an exhaustive list of biases that individuals and groups are subject to in investing. However, Todd and Walsh highlight this one given its all too common appearance with investment committees. They describe the problem:⁹⁵

⁹⁵ <https://www.shrm.org/hrdisciplines/benefits/articles/pages/pension-oversight-mistakes.aspx>

Unfortunately, investment committees are subject to the same biases as retail investors, such as a tendency to look in the rear-view mirror when making decisions, which causes them to increase their investments in asset classes that have performed well recently. This backward-looking approach is dangerous. Instead, plan sponsors need to be forward-looking by asking, 'Based on current valuations, what can each asset class (and the whole portfolio) reasonably expect to return on a forward basis?'

They highlight one very simple tool to avoid the guesswork of when to buy and sell: The use of rebalancing. Maintaining an allocation target and tolerance band forces the investment committee to trim portfolio allocation as valuations become stretched, and to buy investments that may be undervalued relative to other segments of the market.

- **Lack of an investment policy.** Organizations that fail to produce and adhere to this governing document do so at their own peril. First, it protects fiduciaries from allegations by beneficiaries that they did not comply with their “duty of care” by demonstrating a piece of important evidence of a clear process. Secondly, it guides investment decision-making and action i.e. as noted above with regard to rebalancing policy. A disciplined investment process is another key factor to driving effective results over time (Dalbar, 2015).
- **Dysfunctional investment committees.** As examined in the last section, group dynamics are another key factor in limiting and avoiding mistakes. A “bully” member may exert inordinate influence on a committee’s investment decisions. A strong and fair committee chair is key to dampening this effect to build consensus toward effective decisions. Diversity of committees is important for avoiding

groupthink. Relevant – and depth of – experience of the members of the committee must be adequate for successful evaluation of investment decisions.

- **Failure to exercise the duty of loyalty.** Committee members must have a duty of loyalty to the plan and its beneficiaries only. Temptation to direct economic benefits of the plan to the employer or to third parties is a common conflict of interest to which members of committees and boards are subject. This was a topic we examined in depth in Chapter II.
- **Working with a conflicted advisor.** Likewise, organizations are often subject to working with a consultant or advisor who is conflicted by fee arrangements or internal corporate pressures. Such advisors may not be acting in the best interest of the plan, which can result in sub-optimal outcomes. Not picking up on these conflicts is where committees regularly err. However, one reason they are common is because many firms find themselves in the position, from the standpoint of economic incentive, of acting as both “manufacturer and distributor” of their own product, which structurally creates the conflict in the first place. The growth in “independent advisors” has been a form of reaction to that conflict and has been a significant trend in the industry over the last several years.⁹⁶

Turning to the investment manager function, at the Operating Fiduciary level, a recent blog posting asked the thought-provoking question, “Is it possible for an investment management firm to operate with the same level of precision and reliability found in industries where failure is simply not an option?”⁹⁷ Here the focus on operational risk is again emphasized:

⁹⁶ <http://wealthmanagement.com/rias/no-slowng-ria-growth>

⁹⁷ <http://pension360.org/pension-pulse-transforming-hedge-fund-fees/>

To answer this question, we looked at operational practices in industries such as nuclear power, space travel, aviation and healthcare, which face the prospect of catastrophic failure on a daily basis and have the highest standards for reliability and quality – after all, failure in these industries is a matter of life or death. While the consequences of success or failure in the investment management industry may not be quite as extreme, we do believe that investment managers must treat their investors' dollars with the same level of respect and thus operate to the same standards.

In this post, we explore what investment management would look like (sic) if we applied the same level of operational excellence found in these industries. Investment management is a business of precision, yet far too often you hear rumours of 'fat-finger' execution errors, or other more serious issues due to operational failures. And these are only the failures that you hear about – what about the failures that go unreported to clients, or even worse, failures that the investment manager itself is not aware of? What it all comes down to is that errors in investment management, no matter how small, are a sign of a lack of quality, and with a lack of quality there is a potential for loss and deviation from strategy...

...Despite the best intentions of employees, an underlying issue in investment management is that firms are made up of people and people make mistakes – it is inevitable...the staff at these organizations face legitimate challenges such as time availability, stress levels, distractions, and even ergonomics and office culture. As such, a lot can be assessed from a review of the processes in place to manage the 'human factor.'

The author describes application of several methods including due diligence practices, systematic examinations, and even Failure Mode and Effects Analysis (FMEA), which can all aid in the selection of “quality” investment managers with good operational

risk management practices. FMEA is one of the systematic techniques for failure analysis. It was developed by reliability engineers in the late 1950s to study problems that might arise from malfunctions of military systems. An FMEA is often the first step of a system reliability study. It involves reviewing as many components, assemblies, and subsystems as possible to identify failure modes, and their causes and effects.⁹⁸

The Human Error Problem: Models and Approaches

Reason (2000) described the human error problem as something that can be approached in two ways: the individual and the system. The “person approach” focuses on the errors of individuals, blaming them for forgetfulness, inattention or moral weakness. The associated countermeasures are directed mainly at reducing unwanted variability in human behavior. These methods include raising awareness, changing procedures, disciplinary measures, threat of litigation, retraining, “naming, blaming, and shaming”. Followers of this approach tend to treat errors as moral issues, assuming that bad things happen to bad people. Psychologists have referred to this as the “just world fallacy”, a cognitive bias or belief that a person’s actions will automatically bring about morally fair and fitting consequences to that person, good or bad.⁹⁹

The system approach concentrates on the conditions under which individuals work and tries to build defenses to avert errors or mitigate their effects. The basic premise in the system approach is that humans are fallible and errors are to be expected, even in the best organizations. Errors are seen as consequences rather than causes, having their origins not so much in the perversity of human nature as in “upstream” systemic factors. These include

⁹⁸ Nune Ravi Sankar, Bantwal S. Prabhu, (2001) "Modified approach for prioritization of failures in a system failure mode and effects analysis", *International Journal of Quality & Reliability Management*, Vol. 18 Iss: 3, pp.324 - 336

⁹⁹ <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/the-just-world-theory/>

recurrent error traps in the workplace and the organizational processes that give rise to them. Countermeasures are based on the assumption that although we cannot change the human condition, we can change the conditions under which humans work. A central idea is that of system defenses. When an adverse event occurs, the important issue is not who blundered, but how and why the defenses failed.

Error Management Theory

Johnson et al (2013) describe the ubiquity of error and apply adaptive systems theory in describing an approach to error management theory (EMT). In an interesting counterpoint to the heuristics and biases described at length in the behavioral economics and finance literature, a topic we will cover in depth in the next section, they describe biased decisions as adaptive in nature to a world in which decision-making occurs under uncertain – and at times – stressful conditions.

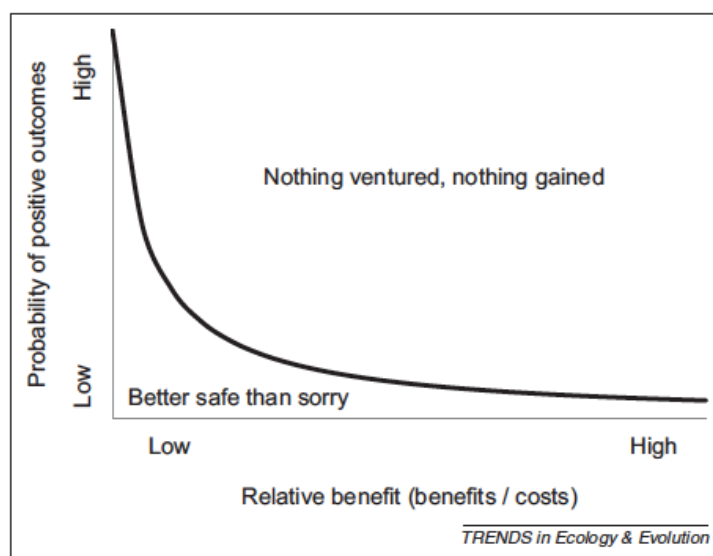
In recent decades, economists and psychologists have documented a long list of biases in human judgment and decision-making, with important consequences for economics, politics, and society. Rather than being mere quirks of human nature, however, there is growing evidence that these biases represent adaptive solutions to the decision-making problems of our evolutionary past.¹⁰⁰

They highlight two states under which decision-making occurs: One where resources are plentiful and one where resources are scarce. Decision-making strategies under either state do not necessarily maximize expected payoffs, but Darwinian fitness.

¹⁰⁰ Johnson, Dominic D.P., Blumstein, Daniel T., Fowler, James T., Haselton, Martie G., "The Evolution of Error: Error Management, Cognitive Constraints, and Adaptive Decision-making Biases", Trends in Ecology & Evolution, TREE-1711, 0169-5347, 2013, p. 2

Under a state of abundance, conservatism is a more effective strategy, where it is better for the organism or actor to err on the side of caution. Under the opposite state of scarcity, rolling the dice for survival, a high-risk strategy, may be the appropriate response. **Figure 4** demonstrates the theoretical relationship between the probability of positive outcomes and the relative benefits and costs.

Figure 4- A Generalized Illustration of Error Management



An example here is warranted, which ties in a bit of Signal Detection Theory. As humans we are more likely to mistake a stick for a snake, than the other way around. The cost of being wrong is relatively high, and therefore our adaptive response is to make a false positive much more frequently than a false negative. What about under circumstances of trying to identify a bad investment manager? Do committees see more snakes or sticks? On balance the decision to terminate a manager, perceived by the committee as suddenly less than desirable, has at best a neutral outcome (Goyal & Wahal, 2008), which suggests the committee sees more snakes than sticks. Better to be safe than sorry.

As an aside, sometimes action is preferable to inaction when inaction would be the better course. Committees may feel they must do something. This is the extraneous act form of error referenced earlier. Market timing is an example where investors buy or sell, to avoid a decline or pursue an extraordinary gain, and research consistently shows that people tend to be ineffective market timers (Dalbar, 2015). Warren Buffet famously described his dictum for avoiding extraneous acts in investing:

Benign neglect, bordering on sloth, remains the hallmark of our investment process.

Reason (2000) discusses the importance of dynamic and resilient systems in error management. Error management has two components: limiting the incidence of major errors as much as possible, and creating systems that are better able to tolerate errors and mitigate their impact. The systems approach is comprehensive and focuses on the entire the organization (tasks, individuals, work teams, departments, divisions, etc).

Most managers of traditional systems attribute human unreliability to unwanted variability and strive to eliminate it as far as possible. In high reliability organizations, on the other hand, it is recognized that human variability in the shape of compensations and adaptations to changing events represents one of the system's most important safeguards. Reliability is "a dynamic non-event." It is dynamic because safety is preserved by timely human adjustments; it is a non-event because successful outcomes rarely call attention to themselves.

Effective risk management depends crucially on establishing a reporting culture. Without a detailed analysis of mishaps, incidents, near misses, and "free lessons," we have no way of uncovering recurrent error traps or of knowing where the "edge" is until we fall over it. The complete absence of such a reporting culture within the Soviet Union contributed crucially to the Chernobyl disaster. Trust is a key element of a

reporting culture and this, in turn, requires the existence of a just culture—one possessing a collective understanding of where the line should be drawn between blameless and blameworthy actions. Engineering a just culture is an essential early step in creating a safe culture.¹⁰¹

Resilience, adaptability in the face of change and a culture that embraces transparency and accountability – and also a better understanding of where people are inclined to react the way they do and take risks and why – are among the keys to better error management in business and finance.

Implications for Pension Board Governance Factors A study of human error is important for this research because as discrete events, practically speaking, human error will be in most cases unobservable to the researcher, and for that reason we must acknowledge especially in striving to model governance that these are inevitably unobservable effects within the model. We also seek to find proxies, or “markers” of governance structures that may help mitigate human error. For example, as will be detailed in Chapter VI, there are a number of proxy “engagement” variables that indicate the extent of focus and attention by the board. While we cannot *per se* see exactly how the board is engaged, or specifically on what they are engaged, we can at least find measures that imply engagement, such as attendance in meetings or the duration of meetings.

¹⁰¹ Reason, James, “Human Error: Models and Management”, *BMJ*. 2000 Mar 18; 320(7237): 768–770. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1117770/>

Behavioral Finance Theory

*The need for justifiable authority to change investing behavior that has been successful in the past imposes a sort of conservative compliance with broadly perceived conventional wisdom and past procedures. **Committees apparently have great difficulty taking action to alter their decisions on the basis of changing weight of evidence.** One does not easily stand up and have impact in challenging conventional wisdom because one's intuitive assessment of probabilities is a little different. One needs a striking argument that is trenchant and on target, otherwise one is likely to have little prospect of impact. When one senses that there is little prospect of having an impact, one tends to hold one's silence, or make only perfunctory objections.*

– **Robert Shiller, “Bubbles, Human Judgment and Expert Opinion”¹⁰²**

Behavioral finance has changed the way we fundamentally view the investor. It has effectively challenged the rational expectations model of neo-classical economics. The theory asserts that people are not walking calculators, seeking optimality at every given point, but rather they are emotional decision-makers that are often lazy, rushed or pressured, and therefore seemed doomed to repeat the same errors, over and over again.

Behavioral finance holds that investors tend to fall into predictable patterns of destructive behavior. In other words, they make the same mistakes repeatedly. Specifically, many investors damage their portfolios by under-diversifying; trading frequently; following the herd; favoring the familiar (domestic stocks, company stock, and glamour stocks); selling winning positions and holding onto losing positions

¹⁰² p.14, Shiller, Robert, “Bubbles, Human Judgment and Expert Opinion”, Cowles Foundation Discussion Paper No. 1303, May 2001

*(disposition effect); and succumbing to optimism, short-term thinking, and overconfidence (self-attribution bias).*¹⁰³

One piece of substantial empirical evidence taken in aggregate is the plight of markets to repeat the creation – and eventual collapse - of market bubbles, also known as financial mania, which are characterized by first gradual and then sudden rapid expansion of prices in a given commodity or asset class segment. This is not a new phenomenon, with two significant bubbles in the U.S. over the last 15 years alone (e.g., 1999-00 “dot com” bubble and the 2005-07 housing bubble). The combined irrationality of investors is the driving factor in every asset bubble.

What lies behind investor irrationality? The nuts and bolts of investor behavior are the heuristics and biases that impel that behavior. In psychology, heuristics are simple, efficient rules which people often use to form judgments and make decisions. They are mental shortcuts that usually involve focusing on one aspect of a complex problem and ignoring others. These rules work well under most circumstances, but they can lead to systematic deviations from logic, probability or rational choice theory.

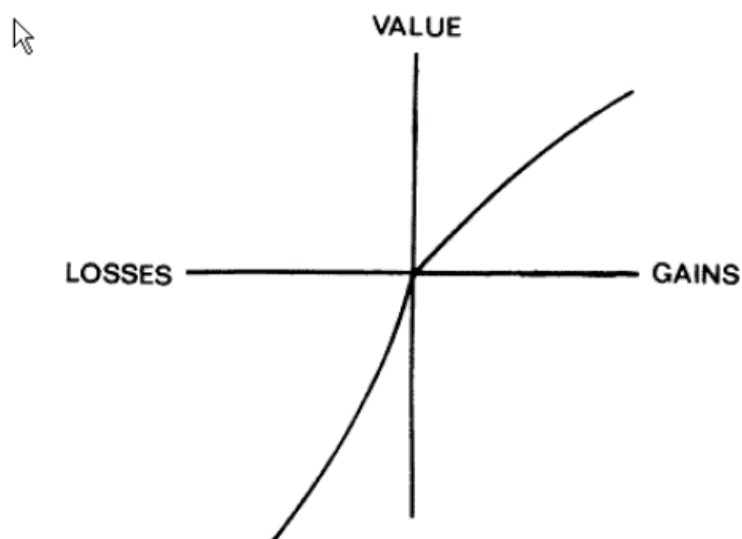
The resulting errors are called "cognitive biases" and many different types have been documented. These have been shown to affect people's choices in situations like valuing a house, deciding the outcome of a legal case, or making an investment decision. Heuristics usually govern automatic, intuitive judgments but can also be used as deliberate mental strategies when working from limited information.

Here is a summary of patterns and biases that are commonly found in investor behavior:¹⁰⁴

¹⁰³ Elan, Seth, Goodrich, Malina, “Behavioral Patterns and Pitfalls of U.S. Investors”, A Report Prepared by the Federal Research Division, Library of Congress under an Interagency Agreement with the Securities and Exchange Commission, August 2010, p.1

- **Loss aversion** – Investors are not so much risk averse as they are loss averse, which can bring about excessive conservatism, particularly at the wrong points in time. In fact, under certain circumstances, investors will engage in risk-seeking behavior, especially when trying to make up for losses. See **Figure 5**. (Kahneman and Tversky, 1979)

Figure 5 – Value Function in Prospect Theory



Source: Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision under Risk," *Econometrica* 47, no. 2 (March 1979): 279.

- **Endowment effect** – People easily attach themselves to things and then value them much more than they valued them before they identified with them. As a result, people tend to hold on to bad or underperforming investments much longer than they should.

¹⁰⁴ Source: Prentice, Robert A., "Ethical Decision Making: More Needed Than Good Intentions", *Financial Analysts Journal*, November/December 2007, unless otherwise indicated.

- **Overoptimism** – People have a tendency toward optimism, an expectation of positive outcomes. It can be so strong it can lead to misguided beliefs and imprudent decisions. In some circumstances, it can also induce unethical conduct.
- **Overconfidence** – Errors caused by overoptimism may be exacerbated by overconfidence, an overendowed sense of belief in one's self, capabilities and decisions. Students, psychologists, engineers, stock analysts, financial analysts, investment bankers and investors among many other categories of people have been shown to tend toward irrational confidence in the accuracy of their decisions.
- **Self-serving bias** – This is a decision maker's bias to gather, process and even recall information to advance perceived self-interest and to support pre-existing views.
- **Confirmation bias** – A related bias where the decision maker seeks out information to confirm the original theory or belief system.
- **Belief persistence** – This is the tendency among people to hold on to beliefs long after the basis for those beliefs has been substantially discredited.
- **Causal attribution theory** – Another tendency among people to attribute above average credit for group success or below average responsibility for group failure.
- **Framing** – Psychologists have demonstrated how a simple reframing of a question can produce a completely different answer from the same respondent. For example, reframing an option in terms of a gain instead of loss can change a person's risk preference dramatically.

- **Sunk costs** – Economists and accountants can demonstrate how consideration of sunk costs is an illogical exercise. Yet, people will attend plays they don't want to, just because they already purchased the tickets. Worse yet, is that sunk costs can lead to an *escalation of commitment*, where more good money is poured in after bad. This can explain a lot of ineffective – and even catastrophic – behavior, for instance rogue traders, and companies “doubling-down” on products that are failing in the marketplace.
- **Time-delay traps** – People tend to emphasize the consequences of the near term over the long term. This tends toward short-termism in decision-making and a common inability to delay gratification. Successful investing most often requires a long-term approach.
- **Conformity bias** – In every aspect of their lives people take cues from those around them about the proper way to act. This bias strongly pushes people to conform their judgments to the judgments of their reference group. This produces a poor group decision-making process, what Shiller described in the opening quote to this section as “conservative compliance with broadly perceived conventional wisdom and past procedures”.
- **Groupthink** – Conformity bias rears its ugly head in the form of groupthink. Pressures from superiors and peers can be reinforced by the tendency of members of a group to avoid introducing stress into unanimity by suppressing dissent and silencing critics. This leads to decisions that aren't subject to an independent, deliberative and thoughtful process.
- **Reluctance to save and invest** – Mitchell and Utkus (2004) refer to an individual's preference for deferring or not deferring consumption based on an individual's subjective discount rate. They define those who defer more

and discount less as “exponential discounters” and those who save little or nothing and discount more as “hyperbolic discounters”. Exponential discounters tend to assign a higher value to future money. This also relates to the concept of *bounded rationality*, or the flawed decisions people make because of limited time, information and cognitive ability.

- **Lack of knowledge / trust** – Financial illiteracy and lack of trust in the financial markets may also play a role in people’s unwillingness to engage in productive investing. Guiso et al (2010) attribute limited participation in the stock market, particularly among wealthy investors, to a lack of trust and to the fear of being cheated by participants in the capital markets. Subjective and cultural factors also determine how trusting people are, as well as whether and how much they are willing to invest.
- **Active trading** – Some gender differences may be a driver of ineffective behavior. Barber and Odean (2009) show how active traders underperform the market. Active trading correlates with overconfidence. They find a correlation between male overconfidence and excessive trading, particularly when comparing single men and single women. Because women are less likely to indulge in excessive trading, they outperform men.
- **Disposition effect** – The tendency of investors is to sell winning positions and to hold onto losing positions to recoup losses on the losing positions (Odean, 1998). *Myopic loss aversion* is a related concept, where investors evaluate their portfolios too frequently and make moves to avoid losses during periods of short-term volatility (Benartzi and Thaler, 1995).

- **Hindsight bias** – This is the tendency, referred to earlier, of investors to look only at the most recent past returns in extrapolating future performance (Kahneman and Tversky, 1979).
- **Familiarity bias** - People prefer to invest in what is familiar, favoring their own country, region, state, and company. This is also known as “equity home bias”, and can lead to ignoring or eliminating a broad swath of potential investments across the investing universe and over-concentration in a specific geography (Huberman, 2009).
- **Under-diversification** – Related to familiarity bias, Statman (2010) explored the lack of diversification in U.S. investors’ equity portfolios. Although mean-variance portfolio theory recommends that portfolios hold at least 300 stocks, the average investor actually holds only three or four, representing an extremely underdiversified portfolio. The typical investor’s concentration in employer, large-capitalization, and domestic stocks also works against the advantages of diversification.
- **Naïve diversification** – Investors are often subject to equally weighting every investment option available to them as they don’t have the tools or understanding to understand differences in each investment. This is a common occurrence in 401(k) investing (Bernartzi and Thaler, 2001).
- **Noise trading** – This describes the activities of “an investor who makes decisions regarding buy and sell trades without the use of fundamental data. These investors generally have poor timing, follow trends, and overreact to good and bad news.” (Barber and Odean, 2008)

Combatting these biases, particularly in the governance setting, requires education and training. It also requires strong and engaged leadership to help foster an open and

thoughtful arena for deliberation, debate and communication. This may be a tall order for many groups that may only meet four times a year for a couple of hours at each meeting.

The general lack of education to promote financial literacy is also a significant and widespread problem. In the “Retirement Income Literacy Survey” conducted for The American College of Financial Services in 2015, 80 percent of the respondents received scores of 60 or lower on financial questions about retirement. Just 20 percent received what amounted to a passing grade.¹⁰⁵

The results are just as dismal when it comes to general financial knowledge. Asked five multiple-choice questions about topics like interest calculations, mortgage payments and investments, just 39 percent of the 25,509 adults answered at least four correctly, according to a 2012 survey from the FINRA Investor Education Foundation. That was down from 42 percent in 2009.¹⁰⁶

Governance Fiduciary Tools for Stanching the Human (Error) Factor

Sufficient oversight and control are two key concepts in effective governance. Transparency, accountability and trust are key ingredients to an effectively governed organization. Better quality – and independent – advice from outside advisors is also extremely important. Trustees can never know everything, so getting access to informed and un-conflicted counsel is important. Better, concise and more timely information and reporting is also important. How that information is disseminated and reviewed is key. Do people understand what they are reviewing? How is the information displayed? As we saw in the Behavioral Finance section, the framing of information is key for decision-making.

¹⁰⁵ <http://retirement.theamericancollege.edu/research/ricp-retirement-income-literacy-survey>

¹⁰⁶ <http://www.finrafoundation.org>

One of the key findings of behavioral science is that investors need streamlined, transparent investment disclosure, particularly in graphical format (Elan and Goodrich, 2010). Finally, training and education cannot be emphasized enough. Throughout my research, the lack of emphasis on training and education as well as relevant prior experience of trustees is a huge impediment to success.

Should We Turn Investment Management over To a Robot?

The last topic, which should not be ignored especially at this point in our technological development, is the rise of the “robo-advisor” and artificial intelligence (AI) in investing. Much has been made of this in the financial press and trade publications as of late. The reality is that the amount of assets moving to firms that use AI is glacially slow. Firms, such as Betterment and WealthFront, emphasize online automation for retail investors in exchange for lower fees. The process of investment selection and portfolio construction is actually more or less the same as it is through more traditional routes, although this might eventually become an area ripe for new research if this notion of what I call “behavioral channeling” occurs, in effect driving the investor through online automation into a disciplined process within a reduced band of activity. This could potentially limit the more damaging effects noted above through reduced degrees of freedom by the investor, in a similar way that better plan design can improve investor behavior for 401(k) investors.

Finally, within the area of asset management artificial intelligence may eventually offer some avenue for boosting performance, and reducing errors, in a way beyond what

“quants” and traders do today with trading algorithms to drive additional return. But as a recent *Financial Times* article cautioned:¹⁰⁷

Even quants that are cautiously optimistic on the future of AI in investing warn of many pitfalls. Algorithms that may look ingenious and backtest superbly against historical data have a nasty habit of unravelling when confronted with unforgivingly fickle financial markets.

“Playing Super Mario might not necessarily work for markets. If you hit the button you always know what will happen, but you don’t in markets,” says another quant at a large hedge fund. “It can take time for it to find the good trades and to optimise them. It can go through a lot of bad trades.”

This has been an examination of human error in investing and institutional fund governance. We have covered extensive ground in this section looking at the essential forms of human error, how that is defined within the industry under the concept of “operational risk”, and approaches to understanding and managing this risk. The contribution of behavioral finance over the last four decades has expanded our knowledge and understanding of deficiencies in the cognitive machinery of the human brain that lead to common errors in investing. Outside of group dynamics, this perspective helps to define the inherent weaknesses of human actors and constituent members that face every investment committee charged with the oversight and management of dedicated funds. It also underscores the importance of structure and process to mitigate these fundamental challenges. Training and education could go a long way as these are generally underemphasized and in short supply. Finally, we touched on the potential future offered by “robo advisors” and AI. Still too early to tell, but both could offer interesting avenues toward

¹⁰⁷ Wigglesworth, Robin, “AI Progress Fails to Convince All Investors”, *Financial Times*, March 25, 2016

reducing error and improving the outcomes of investors, and obviating some of the inherent deficiencies that affect all of us.

Bond Market Vigilantes: When Public Pension Governance Fails

Chicago isn't alone in not having enough money to cover all the benefits that have been promised. Unfunded state and local pension liabilities total \$3.5 trillion, Moody's Investors Service said in a report Wednesday. The consequences of not finding a solution are dire: unfunded pension debt helped drive Stockton, California, into Chapter 9, and Detroit into the biggest municipal bankruptcy in U.S. history. Those same unfunded obligations contributed to the crisis in Puerto Rico.

- Elizabeth Campbell, *Bloomberg*, April 12, 2016¹⁰⁸

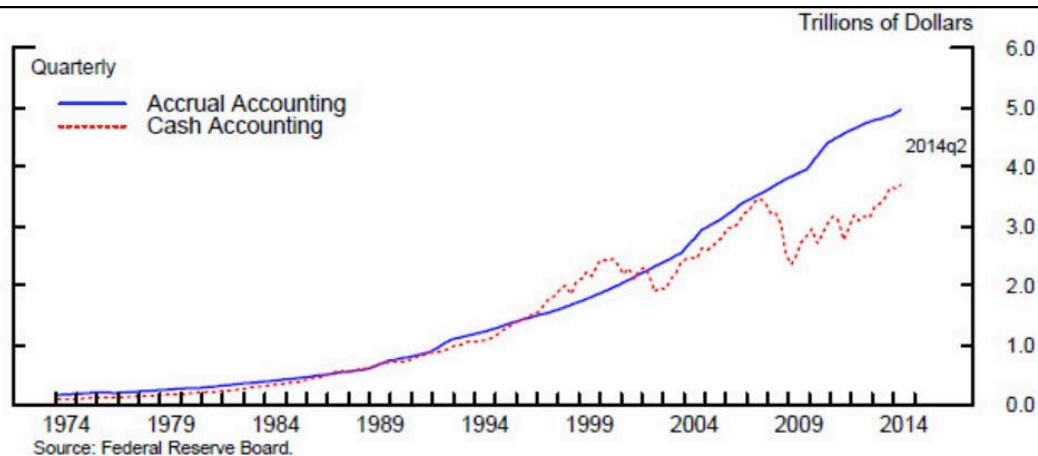
Imperfect governance is everywhere. However, one of the virtues of the capital markets is that it puts investors, those who bear direct financial risk, in the middle of many issues, including the funding of future retirement benefits. For stock and bond investors, public companies are at risk on their corporate plans. For municipal bond investors, state and municipalities are at risk on their public pension obligations. And because of the time value of money, the financial risk to investors is not out in the far distant future, as it is for retirees, but here today.

How does that work mechanically? If the current market value of the assets is significantly below the projected liabilities, then the plan sponsor is left to make up that shortfall today with a pension contribution. Plans historically have depended on investment

¹⁰⁸ <http://www.chicagotribune.com/news/sns-wp-blm-chicago-bonds-eedbc0be-fce0-11e5-813a-90ab563f0dde-20160407-story.html>

returns to fill the funding gap. One study indicated that 64% of pension system revenues come from investment returns (U.S. General Accountability Office, 2007).¹⁰⁹ If this mismatch between assets and liabilities is expected to persist into the future, the investor may perceive significant risk to the future viability of the sponsor to be able to continue to make up these shortfalls indefinitely, putting at risk other obligations such as a bond issue on which it must also make interest and principal payments. The liabilities may come to dwarf the income producing capacity of a company or the tax revenue collecting capacity of a government. In view of this heightened risk factor, the investor may demand a higher premium, or yield in the case of a bond, to offset it, as the creditworthiness of the issuer may be perceived as greatly diminished. **Figure 6** shows the aggregate growth in liabilities of state and municipal plans since the 1970's. **Figure 7** shows the growing gap relative to assets since 1997.

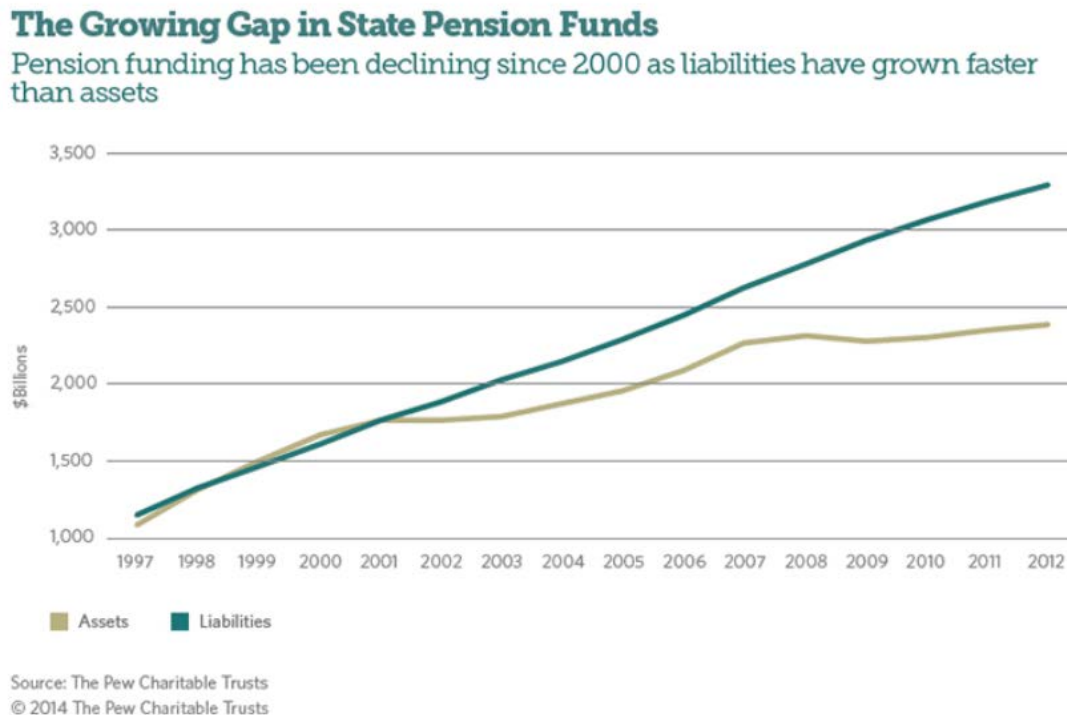
Figure 6: Liabilities of State and Local Pension Funds¹¹⁰



¹⁰⁹ As cited from Matkin et al, "The Governance of Public Pensions: An Institutional Framework", 2016

¹¹⁰ <http://www.federalreserve.gov/econresdata/notes/feds-notes/2014/introducing-actuarial-liabilities-funding-status-defined-benefit-pensions-us-financial-accounts-20141031.html>

Figure 7 - Public Pension Assets and Liabilities, 1997-2012¹¹¹



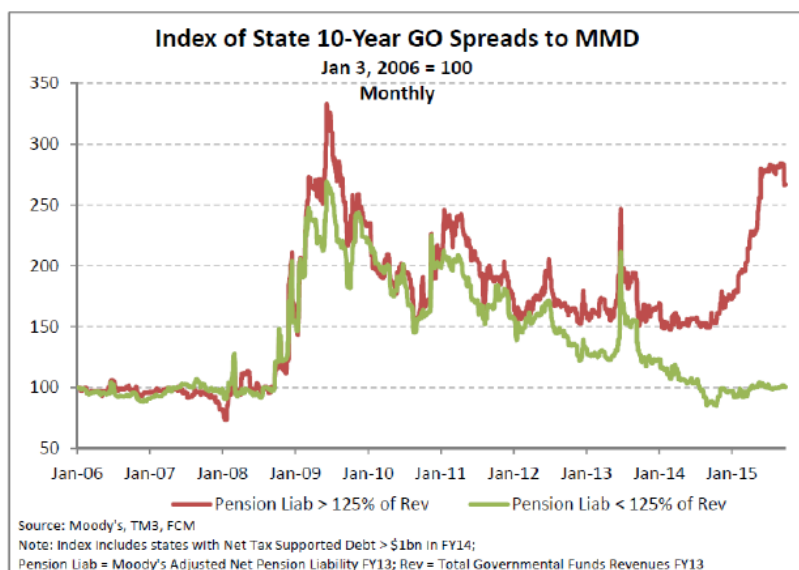
This condition is no longer theoretical, but now empirical. The Chicago pension crisis is proving to be a watershed moment for municipal bond investors. Recent research by Fidelity and J.P. Morgan has demonstrated an increase in the risk premium based on the pension funding risk across the entire municipal market.¹¹² **Figure 8** shows the divergence of bond spreads as defined by two classes of municipalities, those with higher and lower relative pension liabilities as a percentage of revenue. Note in the figure the increase in spreads around the time of Moody’s downgrade of Chicago to “junk” status in May 2015. Investors were demanding in aggregate a 1.6% higher yield to hold the paper of municipalities with higher pension liabilities, more than doubling the interest cost. The increase in the spread reflects an increase in their risk of their municipal bond investment.

¹¹¹Pew Charitable Trusts, “The Fiscal Health of State Pension Plans: Funding Gap Continues to Grow”, April 8, 2016

¹¹² <http://www.snwam.com/insights/blog/2015/9/21/muniland-poor-pension-funding-ratios-lead-to-spread-widening>.

There have been a number of academic studies on the economic linkages between pension liabilities, bond ratings and borrowing costs that go back to the early 1980's. Martin and Henderson (1983) found that the ratings agencies were attributing importance to a firm's pension obligations. A later 2008 study found that unsecured corporate bonds were

Figure 8 – Pension Liability Impact, State General Obligation Bond Borrowing Costs



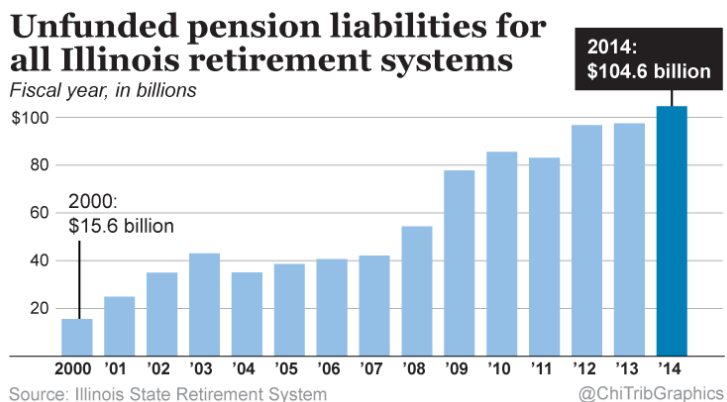
influenced by pension risk, but not senior secured issue (Chen et al). The only security backing a general obligation municipal bond is the *ad valorem* taxing authority of the issuer, which has its limit as witnessed in a number of recent high profile municipal bankruptcies (e.g. Detroit, MI - 2013; Stockton, CA - 2013; Harrisburg, PA - 2011; Birmingham, AL - 2011).¹¹³ “Ad Valorem” from Latin literally translates as “according to the value”. In the

¹¹³ There have been several high profile municipal bankruptcies over the last five years. All of these bankruptcies noted here with the exception of Birmingham were related to pension problems. Detroit was the largest municipal bankruptcy in U.S. history. The city filed on July 18, 2013, and at the time had \$18 billion in outstanding general obligation bonds. *The Washington Examiner* (July 20, 2013 issue) cited public employee pensions as three of the top 10 reasons for the bankruptcy. For more information on these and other municipal bankruptcies see Winegarden's, “Going Broke One City at

context of a municipality, it can imply the unlimited taxing authority of the municipality in relation to a bond issue.¹¹⁴

Where public policy may fail, the experience in the credit markets is that bond investors may force changes as the interest cost increases on a municipality. One could argue that the path the private sector took in the late '80s to move from defined benefit to defined contribution plans was a reaction to the vigilance of its own shareholder base. At the same time, it gives further impetus from a public policy standpoint to avoid such a condition, which could take an already precarious financial situation for an issuer, and make it worse, resulting in a downward financial spiral as appears to be the case in the city of Chicago. This situation is not limited to just Chicago, but effects the entire state. See **Figure 9** for the growth of total Illinois' retirement systems liabilities since 2000, up nearly seven fold. Illinois has the worst funded pension system in the country, with a funding ratio of 39% in 2015.¹¹⁵

Figure 9: Unfunded Pension Liabilities for all Illinois Retirement Systems¹¹⁶



a Time: Municipal Bankruptcies in America”, Pacific Research Institute, January 2014

https://www.pacificresearch.org/fileadmin/documents/Studies/PDFs/2013-2015/MunicipalBankruptcy2014_F.pdf

¹¹⁴ Nuveen Asset Management, “Municipal Bonds: Understanding the Fundamentals”, August 2016

<http://www.nuveen.com/Home/Documents/Default.aspx?fileId=54108>

¹¹⁵ http://www.thinkadvisor.com/2015/07/28/top-10-worst-funded-state-pensions-2015?slreturn=1476471598&page_all=1

¹¹⁶ <http://www.chicagotribune.com/ct-illinois-pension-crisis-info-20150512-story.html>

CHAPTER IV

REVIEW OF THE LITERATURE: ASSET OWNER GOVERNANCE AND FIDUCIARY EFFECTIVENESS

Risk taking cannot be destroyed, it can only be moved from one spot to another.

Jack Cohen, Chairman, Association of BellTel Retirees¹¹⁷

While the Fiduciary Standard has a long and established history, and in its current form has received the most clear definition and guidelines since the passage of ERISA in 1972, most academic research has focused on the standard itself, and ignored the effectiveness as linked to performance condition because, as commonly accepted, performance effectiveness has not been a requirement of the standard.

Evolution of the Prudent Expert Rule and MPT

Definition of the Fiduciary Standard has been clarified and refined over the years. Brown (1977), Klesch (1977) and Pozen (1977) explain the evolution and application of the prudent man and prudent expert rules as defined under ERISA. Landsberg (2013) reviews developments in the standard and how it applies to plan administrators. One initial focus of the standard under ERISA was integrating Modern Portfolio Theory (MPT). Brown finds that ERISA was intended to allow flexibility in the selection of investments not found in personal trust law. In particular, it was not intended to restrict pension fund investment to

¹¹⁷ Segal, Julie, "Can the U.S. Supreme Court Save the American Dream", *Institutional Investor*, May 12, 2016 <http://www.institutionalinvestor.com/article/3553866/investors-pensions/can-the-us-supreme-court-save-the-american-dream.html#.Vzr-navhrBY>

a narrow list of the largest corporations; the fund manager instead is to consider each investment in the light of its effect on the overall riskiness of the portfolio.

Ethics and Agency Problems

Ethics, particularly conflicts of interest, has been a recurring topic in the literature, and rightfully so, as there have been numerous scandals over the years and cases of self-dealing. A.C.G. (1978) discusses the *de facto* standard of loyalty adopted by the courts, and gives examples where self-dealing may be tolerated and actually beneficial in the case of charitable organizations. A recent study by the Tellus Institute (2012) notes the high degree of affiliate relationships with trustees, particularly among northeastern private colleges and universities, which raise questions about the current system of transparency. Schmidt (2011) further explores the limits of the self-dealing principal and common sense boundaries. Ennis (1988) discusses the problems of agency, particularly among public funds, which has led to a condition of chronic underfunding of state and municipal pension plans, and has visited and revisited this topic over the years.

Ribstein (2003) has explored the limits of applying a fiduciary standard due to the increase in litigation and contracting costs and decreasing the effectiveness of owner's governance rights, a topic that has been frequently in the press lately, as Congress and regulatory agencies (the SEC, the Department of Labor) consider a number of proposals to expand application of the Standard to most investment advisors, brokers and financial planners.¹¹⁸ Varnavides (2011) examines the problems and issues with expansion of the fiduciary standard to cover the vast majority of broker/dealers and investment advisors.

¹¹⁸ "Advisor Groups Urge Congress To Support Fiduciary Standard, SEC," by Jeff Schlegel, *Financial Advisor*, March 29, 2011 <http://www.fa-mag.com/news/advisor-groups-urge-congress-to-support-fiduciary-standard-sec-6969.html>

Effectiveness Measures

There is presently no system or methodology in place to examine the fiduciary effectiveness of organizations. Cackowski (2007) discusses how the fiduciary standards of the two main bodies of laws laid down by ERISA and the Uniform Prudent Investor Act (UPIA) do not lend themselves to a straightforward performance analysis methodology or evaluation of fiduciary practice and cites Schwartzel (2006):¹¹⁹

When you are finished, you may or may not agree with me that the twin UPIAs represent "Voodoo Trust Investonomics" – a new set of rules which are so flexible and so fuzzy that in addition to the assistance of outside experts and perhaps a very good computer program, many trustees may need a Witch Doctor to divine the settlor's purpose and distribution scheme from the entrails of the settlor's intent left him in the trust agreement.

His purpose was to come up with a method that would put the effectiveness review under a judicial standard. He goes on to explain how traditional quantitative methods of assessing a money manager's performance do not meet the Daubert judicial standard, under which the Supreme Court in that case adopted the proposition that scientific methodology should be "based on generating hypotheses and testing them to see if they can be falsified...". He instead proposes a methodology using statistical inference in assessing the effectiveness of a money manager's performance or process to determine whether there is statistical consistency, and not randomness, present in the data from which to draw conclusions.

¹¹⁹ "The Twin UPIAs and the new Regulations: Progress, or "Voodoo Trust Investonomics"? C. Boone Schwartzel, April 06, 2006, *Estate Planning Strategies*

Other related work includes Saeli (2011), who suggests a methodology for quantitatively evaluating the effectiveness of defined contribution plans in the public sector by looking at a number of factors including employee participation rates, average contributions, periodic review of managers and service quality and fees.

Governance

For understanding asset owner governance, there are essentially three main approaches: 1) the effect of the political and economic environment, especially as it relates to public pension funds; 2) the organizational design method, particularly employed by Ambachtscheer (1998) and Clark (2007); and finally 3) the institutional framework, which incorporates not just political influences, but a number of other exogenous factors amongst established institutional structures (Matkin et al, 2016).

Clark and Urwin (2007) utilize a number of case studies taken from institutional funds globally to understand the best practices of pension fund governance. They summarize the results of this research with 12 findings under three main categories including Institutional Coherence, People and Process.

Matkin et al (2016) are highly critical of the conventional approach taken by prior researchers in looking at the political economic impact on public pension fund performance, and recommend a new approach that examines the impact of institutional factors in the environment including, for example, policies and procedures and professional norms and standards (i.e. GASB, actuarial standards). They perform a thorough examination of the Florida Public Pension System utilizing this approach, and demonstrate how investment markets, legislative action and actuarial norms and standards impacted the performance

and funding level of the plan over a thirty-year time period. They conclude by calling for more national level data to enhance our understanding of public pension finance:

More data on each of the formal institutional categories in this study will help researchers understand how and why these institutions change over time and the effects of those changes on the financial performance of public pensions.¹²⁰

Ambachtsheer examines fund governance structure in several papers and a book, *Pension Fund Excellence*. “Improving Fund Performance” (1998) looked at three drivers of pension fund performance: fund size, proportion of assets passively managed, and quality of the fund’s organizational design, and offered suggestions on improving performance by improving elements of the fund’s organization. In addition, Ambachtsheer (1994) has explored the cost – value relationship of pension managers, and found marginal significance in the relationship, i.e., the higher the management fee, the marginally greater the return.

Over the last fifteen years, two organizations have produced a fiduciary ratings system of mutual funds:

1. Morningstar launched the Stewardship Grade rating system in 2005. This system looks at alignment of interests between fund managers and shareholders. The Stewardship Grade is determined using some quantitative measures, but it is primarily based on Morningstar's qualitative analysis of a fund family’s stewardship of fundholders' capital.¹²¹
2. Fiduciary Analytics (now FI360 since 2003), launched its Mutual Fund Family Fiduciary Rankings in 1999, now called the Fiduciary Score.

¹²⁰ Matkin, David S.T., Chen, Gang, and Khalid, Hina, “The Governance of Public Pensions: An Institutional Framework”, *Administration & Society*, 1-29, January 28, 2016, p. 25

¹²¹ <http://news.morningstar.com/articlenet/article.aspx?id=115118>

The Score evaluates mutual funds on nine different criteria across a spectrum of quantitative data points to determine if the investment meets a minimum fiduciary standard of care. The nine criteria include: regulatory oversight, track record, assets in the investment, stability of the organization, composition consistent with asset class, style consistency, expense ratio/ fees relative to peers, risk-adjusted performance relative to peers, and performance relative to peers.^{122 123}

Chen and Huang (2011) have examined the effectiveness of the Morningstar Stewardship Grade rating, and have identified certain relationships between governance practices and fund performance. While these systems are intended to assist investors in mutual fund selection, they do not address asset owner governance.

A white paper, “Fiduciary Responsibilities of Investment Committees”, written by Fund Evaluation Group (2011), an investment consulting firm, successfully defines many of the issues that are the focus of this study.¹²⁴ Maurek (1996) discusses the usefulness of fiduciary audits in improving pension plan operations across a number of areas.

Ilkiw (1997) explains how imperfect fund governance can lead to poor performance outcomes. He describes how many unqualified people find themselves in the position of a governing fiduciary. He describes this condition:

What should be disconcerting is that many funds are governed by fiduciaries with limited or poor understanding of pension financing, investment and organizational principles, which can impair fund returns.

¹²² www.fi360.com

¹²³ <http://www.fi360.com/products-services/tools-overview/fi360-fiduciary-score>

¹²⁴ “Fiduciary Responsibilities of Investment Committees”, Christopher M. Meyer, CFA, (White Paper), Fund Evaluation Group, 10/1/2011, http://www.feg.com/research/focus_topic.php?nID=151&issue=2011_10

He also suggests that two lines of defense against catastrophic failure among pension funds in general are: 1) diversification, and 2) an infrastructure of service providers (including actuaries, investment managers, lawyers, auditors, custodians and consultants), that while maximizing fees for service, generally provide competent service.

There have been periodic studies that have attempted to quantify the impact of decisions particularly with respect to the hiring and firing of investment managers by plan sponsors. In two separate studies, Heisler et al (2004) and Goyal and Wahal (2008) conclude that terminations are usually at the wrong time based on subsequent investment performance of the terminated manager, or are neutral at best to improving performance.

Wood (2006) has looked at the behavioral biases of investment committees, which act as impediments to goal achievement. For example, he explains the Ringelmann Effect, which describes the inverse relationship that exists between the size of a committee and the magnitude of each group member's contribution to the accomplishment of the committee's goals.

A recent collaboration between Spence Johnson, a pension research and advisory firm in the U.K., and Russell Investments produced the "The Russell Pension Governance Index 2013". This involved survey work with 40, mostly large, corporate pension plans. The survey examines three areas and is based on six measures: 1) costs, total costs and nature of costs; 2) forms of decision-making, degree of delegation, and degree of internal delegation; 3) people, extent of trustee input as measured by committee hours and people with specific qualifications – a financial or accounting background – as a percentage of all trustees.

While the variables reviewed were of interest, and this provided some method for peer benchmarking, deficiencies in the study were several: 1) no single comprehensive

measure of governance despite its name; 2) no link to performance; 3) reliance on survey (i.e. self-reported) information; and 4) finally, the study has not been repeated.¹²⁵

The inherent problem of being reliant on survey data that many studies around this topic, like the Spence study face, is that it introduces self-reporting bias in the data, which renders any claims or conclusions dubious at best. Donaldson and Grant-Vallone (2002) explain the issue:¹²⁶

Accurate measurement of organizational behavior is essential for advancing the field. Despite its importance, measurement in organizational settings is often referred to as one of the main shortcomings of organizational behavior research (Donaldson, 1995; Donaldson, Ensher & Grant-Vallone, 2000; Mersman & Donaldson, 2000). This is because researchers must rely to a large extent on self-reports. Such measures are common because they are relatively easy to obtain and are often the only feasible way to assess constructs of interest.

Sackett and Larson (1990) found that over a third of all studies published in mainstream organizational behavioral journals between 1977 and 1987 were questionnaire-based. It was found that 83% of these studies used a cross-sectional design and 52% relied solely on self-report measures. Studies which rely on self-reports as the only measure of organizational behaviors have come under attack recently for two primary reasons: 1) self-reports are prone to many kinds of response bias (see Campbell & Fiske, 1959; Donaldson, Thomas, & Graham, 2002; Graham, Collins, Donaldson, & Hansen, 1993; Schwartz, 1999; Stone et al., 2002), and 2) inferences about correlational and causal relationships may be inflated by the problem of

¹²⁵ "The Russell Pensions Governance Index 2013," October 2013,

http://www.pensionsgovernanceindex.com/resources/RPGI_Oct+2013_Final.pdf

¹²⁶ Donaldson, Stewart I. and Grant-Vallone, Elisa J., Understanding Self-Report Bias in Organizational Behavior Research, *Journal of Business and Psychology*, Vol. 17, No. 2, Winter 2002

common method variance (Borman, 1991; Donaldson, Thomas, Graham, Au, & Hansen, 2000; Spector, 1994).

Blake et al (2012) describe the trend away from centralized to decentralized management by plan sponsors and greater portfolio diversification through the use of multiple managers in each asset class, trading off higher anticipated alphas of specialist managers with the increased difficulty in coordinating risk-taking and the greater uncertainty regarding their true skills.

While there has been to date few studies undertaken to look for the discrete factors that define and determine governance and fiduciary effectiveness – and no empirical factor analysis to explore a link to performance, the gap is narrowing as, for example, in the Cackowski study. Why has it taken this long? Because common wisdom has lead people to overlook undertaking a factor analysis of organizations linking fiduciary attributes to performance outcomes.¹²⁷

Most systems have focused on investment managers, such as the Morningstar and FI360 ratings, and others have looked at one or two aspects of the fiduciary issue. To date, no study has comprehensively examined fiduciary effectiveness of asset owner organizations as a whole, nor applied it so that it can be used in comparing across organizations and across time.

Table 4 shows a summary of empirical studies in this field. Each are interesting in their own right for the particular area of research they take on, and to their credit offer methodologies on which to build, but none have focused on an overall fiduciary effectiveness score for the governing fiduciary. A new approach might take the techniques of corporate governance, the approach of our research method, and apply them to asset

¹²⁷ "Fiduciary Responsibility: Liability and Consequences, Stuart Ober, AIFA, *Journal of Financial Planning*, 2005, p. 50

owner governance in a similar way. Empirically, there is a positive relationship between corporate governance scores and firm performance as described by Brown and Caylor (2004).

Table 4 – Summary of Relevant Empirical Research

Author Study	Topic	Hypotheses	Sample	Tests	Findings
Ambachtsheer, 1994	Economics of pension fund management	<p>a. Fund size, management type, sponsor type, may explain policy-adjusted returns</p> <p>b. Systemic factors may impact fund operating costs</p> <p>c. Higher manager fees may be linked to higher performance</p>	<p>a. and b.: 184 pension funds (1990-1993)</p> <p>c. 76 pension funds (1991-1993)</p>	<p>a. Analyzed pension fund production function</p> <p>b. Examined fund implementation returns versus fund characteristics</p> <p>c. Analyzed payback on incremental cost</p>	<p>a. Raw fund returns “too noisy” to be subjected to comparative measurement.</p> <p>b. Systematic factors explain 60% of the variance in fund operating costs.</p> <p>c. One unit of discretionary operating costs produced three units of incremental return, but results were only marginally significant.</p>

Author Study	Topic	Hypotheses	Sample	Tests	Findings
Ambachtsheer et al, 1998	Drivers of pension fund performance	Fund size, proportion of assets passively managed, quality of the organizational design may be the key drivers of pension fund performance, adjusting for costs and risk	a. 80 U.S. and Canadian pension funds (1993-1996), differing and smaller sample sets for each factor	Regressed RANVA (Risk-adjusted net value added) against four factors CEO, (Pension Fund CEO average scored responses to questionnaire), fund size, percentage of funds invested in passive investments, Jaques OD score (organizational design score)	When adjusting for cost and risk, funds in aggregate are underperforming their benchmark return by 60 bps., which is a significant opportunity cost. Organizations that are large should passively manage their portfolios, smaller organizations should outsource. Governance and organizational design are important factors.

Author Study	Topic	Hypotheses	Sample	Tests	Findings
Heisler, 2004	Why do plan sponsors terminate their investment managers?	Poor, inconsistent performance drives investment decision to terminate a manager.	Active domestic equity funds from PSN database of 7,000 separate account investment managers (1989 to 2000)	Fixed effects regression looking at asset flows as a proxy for hire/fire decisions using unbalanced panel sets.	Plan sponsors may minimize job risk by hiring and firing managers based on excess returns with incremental allocations based on total returns, thereby satisfying both their mandate and their clients. Smaller and older products capture greater flows.
Cackowski, 2007	Fiduciary selection and monitoring of investment managers under the Daubert judicial standard	Statistically testing that a money manager is worse than random.	51 of the largest mutual funds with 10 years of data (5/29/1997 – 6/4/2007)	Back testing manager returns through the use of a binomial model to test whether the returns are consistently and significantly different from the relevant benchmark.	Statistical inference is more robust than a ranking methodology, and would meet the judicial test under Daubert. A manager who cannot be identified as better than random or statistically consistent should undergo further review.

Author Study	Topic	Hypotheses	Sample	Tests	Findings
Goyal & Wahal, 2008	Selection and termination of investment managers by plan sponsors	The effectiveness of plan sponsors in making hiring and firing decisions of investment managers	8,755 hiring decisions by 3,417 plan sponsors (1994-2003) 869 firing decisions by 482 plan sponsors (1996-2003)	Examination of pre- and post-hiring and post-termination returns of investment managers.	<p>Post hiring of managers show on average, with zero excess returns, no timing ability of plan sponsors.</p> <p>Transition to a new manager poses both opportunity and friction costs to a new manager that range from 1-2% of assets.</p> <p>Behavior of funds is not irrational as there is persistence in active excess returns of investment managers, but results are on average, after costs, no better than if no change had been made.</p>

Author Study	Topic	Hypotheses	Sample	Tests	Findings
Chen & Huang, 2011	Morningstar Fiduciary Grades and mutual fund performance	Study of relationships between the grades and performance, "motivated by the expanding literature on the uses of corporate governance indexes." Expect a positive relationship.	4,164 mutual funds graded by Morningstar, 2006 to 2009	OLS and quantile regression models looking at overall grades, manager incentive ratings, board quality ratings, and portfolio turnover	<p>Strong relationship between the Stewardship Grade and the Sharpe ratio.</p> <p>Manager incentives not a good predictor of future performance, but board quality is.</p> <p>Corporate governance policies can be effective.</p>
Blake, 2012	The long-term secular trend of sponsors move from balanced managers to multiple specialist managers	Investigation of the extent and effectiveness of the trend. Is it rational?	2,385 U.K pension funds, 1984-2004	Performance evaluation models, Jensen's alpha, residual-resampling bootstrapping procedure, Treynor-Mazuy total performance measure.	<p>Most pension funds shifted over the period. Competition between multiple managers produces better performance, and due to coordination problems of additional managers fund managers react by controlling risk levels. Total pension fund risk is lower under decentralized investment management. Change is preceded in most cases by poor performance.</p> <p>In the latter case, part of the poor performance was due to the fund becoming too large for a single manager to manage effectively.</p>

Author Study	Topic	Hypotheses	Sample	Tests	Findings
Matkin et al, 2016	Institutional framework	Institutional approach is superior to political economic one; critical of common explanatory factors	Florida pension system	N/A	Several institutional factors caused changes in the value and funding level of Florida's pension system over 30 years including allocation, changes in standards and legislative action. More national level data is needed.

CHAPTER V

METHODOLOGY

In this chapter, we discuss the methods we employed for original research on fiduciary effectiveness. As noted throughout, many prior studies on asset owner governance utilize survey-based methods of research, which, as we will discuss in some depth below, are problematic in their reliance on the opinions from their subjects of study, in this case governance fiduciaries. In this study, we departed from this trodden path, to gather data from primary sources, namely meeting minutes of public pension plan boards. Before we go through the specific steps and procedures applied in this study, let us first review the range of methods that were available to us.

Background on Communications Research Methods

There are three general methods of gathering board governance data: 1) **Assessments**: self-assessments, audits and surveys; 2) **Live Action**: interviews and direct observations; and 3) **Board Artifacts**: the gathering of information from available board documents, such as meeting minutes, policies, memoranda, notices and reports. Each has their advantages and disadvantages.

Assessments Board self-assessments and audits are for boards interested in gauging the effectiveness of the board itself, and identifying areas for improvement. While anecdotal in nature, although repeated across several sources, the mere anticipation of a self-assessment can bring about an improvement in board effectiveness (Conference Board report, 1998; *Great Boards*, 2013). The Governance Self-Assessment Checklist (GSAC) is one

instrument developed by Gill, Flynn & Reissing in the early 2000s (Gill, Flynn & Reissing, 2005). It was developed to:

...assist board of directors of non-profits and public sector organizations, educate board members about the essentials of good governance, and improve governance practices.

Gill et al set out to develop a tool that improved on the Board Self-Assessment Questionnaire (BSAQ), a frequently used instrument for non-profit board self-assessment – but one the authors’ found lacking in the assessment of structure, processes and behaviors. The goal of the GSAC was to measure board effectiveness and link that to measures of organizational performance. Gill et al understood that to be a valid instrument it needed to have explanatory power. Their 2005 study reports success in assessing best governance practices and predicting organizational effectiveness (ibid).

To be a useful and effective tool, in the authors’ view, the assessment questionnaire needed to be easy-to-use and be composed in simple language, have a reasonable completion time, be comprised of research-based best practice benchmarks empirically associated with organizational effectiveness, relevant, use general systems theory constructs, be comprehensive, generate interpretive reports, and finally, collect data for purposes of comparison and benchmarking. They intended that the instrument not only act as a self-diagnostic, but also be used for education and governance improvement (ibid).

To demonstrate the usefulness of self-assessment scores in research studies, Adamson (2011) in his examination of school district boards compared the effect of board member training on differences in BSAQ scores. He found positive correlations between board members’ perceptions of performance in specific competencies measured by the self-assessment instrument and the aggregate training of their respective boards.

Internal audits are a similar approach to self-assessments. The only difference is that instead of the board undertaking it, a department from inside the organization, typically the internal audit department, undertakes a review of the board and its committees. For example, the Kaiser Foundation Health Plan in 2013 completed a multi-year audit of the effectiveness and accountability of the board's six key committees. Kaiser's board and management found this to be a successful means to improving governance effectiveness (Totten, 2013).

The audit examined board and committee activities and evaluated the charter and corporate governance guidelines against best practices in areas such as director qualifications, corporate code of ethics, annual board performance evaluations and the role of the board convener. The board convener is a unique board position at Kaiser that acts independently of the CEO and chairperson, which are not separate roles, to approve meeting agendas and schedules, preside at all meetings of non-management directors and at executive sessions, act as the liaison to the board's independent directors and balance the board and CEO functions (ibid).

The auditors identified best practices using resources such as Sarbanes Oxley (SOX) requirements, governance policies of other large organizations and the Conference Board's report on "The Commission on Public Trust and Private Enterprise". A senior audit manager conducted the audit. Methods of gathering information included observation of committee meetings to assess the dynamics of interactions and to determine whether enough time was spent on each agenda item. The auditor also interviewed members of each committee (ibid).

For a social science researcher, the primary advantage of self-assessment and survey data is that the information can be collected and analyzed from a large number of organizations. The downside, of course, is making sure the data are meaningful and not

biased. How organizations report on themselves is bound to be fraught with some bias, and the nuances of how board members work together may not carry over. An example of the use of survey data was in the Clark et al (2006) paper on pension fund board member competence. A 60-minute survey was administered to 40 pension fund board members. The survey covered a range of topics around reasoning and decision-making.

Self-assessments of boards are now very common among public companies, with 92% of companies participating in some form of self-evaluation, up from 25% in the early 1990's (Conference Board Report, 1998).¹²⁸ While the data is out there, gaining access to that information may still be quite limited, although some boards do release that information as part of their annual disclosures and proxies.

Live Action Direct contact with the boards and directors is the obvious choice in seeing first hand their effectiveness. Unlike survey and self-assessment data, this information is real-time and directly accessible. These methods have been utilized in two research papers referenced for this dissertation (Loch & Fortuna, 2012 and Mar, 2011). Fortuna & Loch in "Boardroom Cultural Governance" interviewed 24 directors representing 61 corporations, 31 Fortune 500 and 12 Fortune 1000 companies.

Mar (2011) selected three school district boards and videotaped board meetings for each. She then applied a methodology for collecting and interpreting the data from each meeting using the Observable Task Behaviors and Observable Process Tables for coding and analyzing verbal interactions. She was then able to interpret the information statistically to draw inferences and conclusions.

This kind of approach can generate some genuine insights. To truly penetrate the black box, one must enter it. However, the data gathering is inherently restrictive to a small number of organizations. Additionally, selection bias is a likely to enter in to any study.

¹²⁸ 2012 NACD Public Company Governance Survey, <http://blog.nacdonline.org/2012/08/undertaking-an-honest-self-assessment-is-your-board-aligned/>

While Mar (2011) was interested in examining effective boards *ex ante*, and knew she would be only able to work with a very small number of organizations (less than six), based on her data gathering technique, which involved hours of videography, this created a sample selection problem. Because she relied on the opinions of others in making those selections, and because this method was clearly not randomized, this introduced an effect that meant her population under study was not necessarily or even likely to be representative.

Board Artifacts Finally, the last source of information to undertake direct examination of boards is what the boards say about themselves in written form to glean insights on their effectiveness. Again, the goal is to understand more about their process and decision-making that is not accessible through an examination of board structure alone. Corporate boards disclose all kinds of information, particularly public companies in the form of proxies and other SEC filings. Public pension funds make publicly available many forms of documents and disclosures including meeting minutes, investment policies, agenda, and other information. Collection and examination of these data can provide insights into how the board conducts itself, what it decides and when. Unlike interviews and direct observation, which may limit the researcher to a small sample, gathering information from public documents can broaden the dataset in the same way that survey data can. Information can be gathered from literally hundreds, or even thousands, of organizations. The challenge here, of course, is collecting the information in a usable format, which is a labor-intensive process.

For my research into institutional fund governance effectiveness, we have constructed a dataset from an examination of sample public pension funds. We have gathered data primarily from meeting minutes and legal disclosures over a five-year period for a longitudinal unbalanced panel study of pension fund governance and performance.

This data set offers the opportunity to glean a better understanding of board process, examination of factors behind effective boards, and link those factors to performance and legal outcomes. By leveraging the existence of performance metrics already available through other public databases, the Boston College Public Pension Fund database in particular, we have the opportunity to combine both process and performance data to understand the interplay of factors in driving board effectiveness with a large set of empirical data.¹²⁹

In this way, we are able to bridge the gap between survey and interview data: The former fraught with self-reporting and selection bias (what people say about themselves and their organizations, and how organizations are selected), and the latter with sample sizes that are inherently limited because of the time involved in hand-collecting the data.

The new methodological approach is different in one compelling and penetrating respect: industry and academia for the last twenty years have based notions of best practices on the collection of survey data. The 2013 Spence Johnson study mentioned earlier and more recently, a 2016 study commissioned and published by State Street, are but two of only many examples of this.¹³⁰

Using a combined approach of both board disclosures and surveys may offer the best way of tackling the problem. Gill et al (2005) in their development of the GSAC utilized the self-assessment form along with separate survey information to understand the link between board practices and performance. Our intention is to follow up this dissertation with the development of a best practices survey for future research. In approaching the problems of pension fund governance as it relates to performance outcomes, we can then determine whether the survey has some explanatory power by analyzing survey responses,

¹²⁹ Boston College Center for Retirement Research U.S. Public Pension Plan Database

¹³⁰ "Pensions with Purpose: Meeting the Retirement Challenge", State Street Corporation, February 2016 and the 2013 Pension Governance Index Report, Spence Johnson.

compared to the independent measures of board evaluation through document disclosure, and then examine both sets of relations to performance outcomes.

In the end, any instrument, survey or self-assessment, to be an effective governance evaluation tool, should meet the following criteria: “have excellent internal consistency reliability, exhibit good criterion-related validity and be able to discriminate between stronger and weaker aspects of board functioning”(Gill et al, 2005).

We discussed a number of communications research methods already being employed, referencing two recent school district board studies that used observational (video-taping) and survey approaches, as well as a corporate governance study that employed an interview-style approach. I also shared how using publicly available documents and disclosures, such as meeting minutes and investment policies, may be useful in gathering larger amounts of data for analysis and comparison. Consideration was given to the strengths and weaknesses of each approach.

Research Method

The research method is made up of three overarching steps:

Step 1: Factor Identification The first step is comprised of identifying the key factors that determine fiduciary effectiveness. The interdisciplinary approach of this research references the current literature across finance, law, organizational behavior (sociology and psychology) and ethics, which has informed the process of understanding and determining applicable categories and attributes. These factors have been gleaned from our review of the literature presented in Chapter III and IV, so it has been a matter of prioritizing and selecting the ones that are most important, finding what data are available for each, and then analyzing the data to determine which factors are significant.

These factors fall within the following four general categories: Board Structure, Board Process, Human Factors and Decision-making. **Table 5** lists comparative factors from four distinct theoretical approaches of examining public pension fund governance, which include:

- Political economy
- Organizational design
- Institutional
- Empirical / "corporate governance"

Table 5: Public Pension Fund Governance Factors Comparative

Theorist	Approach	Comparative Factors											
Clark and Urwin	Organizational design	Mission clarity	Investment executive	Effective time budget	Required competencies	Leadership	Effective compensation	Strong beliefs	Competitive positioning	Risk budget	Real time decisions	Mgr. line-up process	Learning Org.
Matkin et al	Institutional	Political Environment	Managerial	Macroeconomic	Investment markets	Legal	Professional norms and standards (actuarial, GASB)	Stakeholders	Policies and practices -Personnel -Benefits -Contributions -Actuarial				
Merker & Peck	Empirical / "Corporate Governance"	Type of Member - professional staff - appointed/elected -retiree / other	Meeting duration	Length of meeting minutes	Committee membership -audit -operations -legislative -personnel -administrative -budget -education -evaluation -executive review -benefits -deferred comp - claims & service	Use of Consultant / Present at Meeting	Nature and character of discussion -performance -watch -on notice -termination -fees -risk -asset -allocation -adjust -pay for play -change	Attendance and Form of attendance (in person/by phone)	Investment conference interest	Multiple plans /multiple boards	Internal / external mgt	Investment Policy Statement (IPS)	Member Turnover

	Governance Issue	(expertise/political process/stakeholders)	(quality of attention)	(transparency, quality of attention)	(structure/number of committees)	(outside expertise)	(quality of issues)	(quality of attention)	(competency)	(fiduciary oversight)	(org. form)	(fiduciary oversight)	(org. stability)
					-law & rules -compliance -disability -elections								
Theorist	Approach	Comparative Factors											
Cogburn, Carney, Marks, & Chaney et al	Political economy	<u>Political preferences</u> -political ideology or culture -partisan representation and competitive control of legislatures -Union representation -Number of employees and payroll size -Employee classifications of plan participants -Median voter proxies -political intervention	<u>Fiscal stressors and constraints</u> -fund balance -credit rating -unemployment rate -budget stabilization fund -balanced budget requirement -tax burden -debt burden (outstanding debt or interest cost)	<u>Administrative professionalism</u> -accounting and disclosure quality -external recognition (i.e. Government Performance Project – GPP scores, Government Finance Officers Association (GFOA) certificates) -legislative professionalism									

Step 2: Population and Sample As was mentioned earlier, for the study period, there were approximately 6,300 public retirement systems in the United States with over \$3 trillion in assets. Our sample begins with 163 of the largest state and municipal pension systems from this population representing assets of over \$1.4 trillion, or 47% of the population by assets. It is based on the Public Plans Database provided by the Center for Retirement Research (CRR) at Boston College. In addition to covering a wide swath of the asset universe among this sample, we also utilized it because CRR has collected extensive financial and actuarial data over the past 15 years. This dataset made available many of the financial and control variables as necessary inputs into the governance models we developed, and discussed in the next chapter. Additionally, using this list of plans from the sample, we were able to locate and collect extensive legal data on each. Finally, we examined these plans over a five-year period, 2008-2012, to capture a market cycle.

This timeframe, of course, coincides with the GFC, which effectively began with the collapse of Bear Stearns on March 13, 2008 and its aftermath.¹³¹ While we view this as an extraordinary period in financial history, we do believe it strengthens the power of the test of our analysis, because it allows us to examine governance practices and their related effects under extreme conditions. It is highly likely that how organizations prepare, think and act in advance and during times of crisis is critical to their performance during such periods.

We used one-year forward returns reflecting that the governance process has a one-year lag based on our analysis of the data. What this means is that at the point when decision are taken, there is a time delay effect in place for those decisions to see a measurable impact. For example, the decision to change investment strategies, while having

¹³¹ Kelly, Kate, "Inside the Fall of Bear Stearns In 72 nail-biting hours, an investment bank turned from healthy to nearly insolvent", *Wall Street Journal*, May 9, 2009

some immediate effect of course, for it to be quantifiable takes time, and this bears out in the data.

Once collection of the data was completed, we went through the exercise of cleansing the data, and making sure there were no errors in the recorded observations. In addition to a manual review of the data, it also involved reviewing and analyzing the aggregate statistics for any abnormalities in the data including any unusual outliers.

Step 3: Data Collection and Procedures Once the set of factors was determined, the next step was to identify the data sources to gather empirical data on each factor. We have chosen public pensions as our primary organizational type for analysis. We could have chosen any number of institutional categories as the issues are similar, if not the same. The reason we have chosen this population for study is threefold: 1) source data is readily available through public disclosures. Public organizations have more information publicly available, which include, for example, meeting minutes, agenda, and other memoranda that are in the public domain; 2) we are able to leverage existing data sets e.g. the Boston College database and other industry data; and 3) to contribute to the debate within the public sphere around this topic.

Over the last two years, we have hand-collected data on 163 public pension plans over a five year period, 2008-2012. We have collected these data in two separate databases, one containing over 50 asset owner governance variables (the Governance Database, and one containing over 20 legal variables (the Legal Database). We employed research assistants in both the Marquette law school and in the business school finance department to gather data for each separate database. For the Governance database, our research assistants collected the meeting minutes for every organization available online over the five year study period. They then reviewed every document and recorded observations for each data point. For the legal database, the research assistant collected data from multiple

legal database sources, using Bloomberg, Westlaw and Lexis Legal, to collect observations for each pension plan in the sample over the five-year period. See **Table 6** for the full list of plans from the BC database, and **Table 7** for the study sample. A summary of the variables for each data set is included **Tables 8 and 9**.

Table 6 – Boston College Database Public Plans List (Market Value in '000s), 2012

Plan ID	Plan Name	Market Value	Plan ID	Plan Name	Market Value
1	Alabama ERS	\$ 9,188,696	81	North Dakota PERS	\$ 1,734,040
2	Alabama Teachers	\$ 18,950,126	82	North Dakota Teachers	\$ 1,654,150
3	Alaska PERS	\$ 6,118,294	83	NY State & Local ERS	\$ 130,506,040
4	Alaska Teachers	\$ 3,006,647	84	NY State & Local Police & Fire	\$ 22,888,394
5	Arizona Public Safety Personnel	\$ 5,055,828	85	Ohio PERS	\$ 67,668,088
6	Arizona SRS	\$ 26,402,094	86	Ohio Police & Fire	\$ 10,602,834
7	Arkansas PERS	\$ 5,692,416	87	Ohio School Employees	\$ 10,201,186
8	Arkansas Teachers	\$ 11,483,886	88	Ohio Teachers	\$ 60,693,620
9	California PERF	\$ 236,981,952	89	Oklahoma PERS	\$ 6,821,304
10	California Teachers	\$ 151,318,064	90	Oklahoma Teachers	\$ 10,194,736
11	Chicago Teachers	\$ 9,437,316	91	Oregon PERS	\$ 53,659,424
12	City of Austin ERS	\$ 1,863,468	92	Pennsylvania School Employees	\$ 48,533,796
13	Colorado Municipal	\$ 3,166,132	93	Pennsylvania State ERS	\$ 25,389,336
14	Colorado School	\$ 20,676,356	94	Phoenix ERS	\$ 1,795,690
15	Colorado State	\$ 12,797,352	95	Rhode Island ERS	\$ 5,997,982
16	Connecticut SERS	\$ 8,468,641	96	Rhode Island Municipal	\$ 1,164,819
17	Connecticut Teachers	\$ 13,482,136	97	San Diego County	\$ 8,515,439
18	Contra Costa County	\$ 5,654,581	98	San Francisco City & County	\$ 15,293,724
19	DC Police & Fire	\$ 3,681,854	99	South Carolina Police	\$ 3,269,990
20	DC Teachers	\$ 1,503,486	100	South Carolina RS	\$ 21,536,908
21	Delaware State Employees	\$ 6,914,826	101	South Dakota RS	\$ 7,842,524
22	Denver Employees	\$ 1,781,633	102	St. Louis School Employees	\$ 896,542
23	Denver Schools	\$ 2,996,078	103	St. Paul Teachers	\$ 881,926
24	Duluth Teachers	\$ 194,553	104	Texas County & District	\$ 19,885,316
25	Fairfax County Schools	\$ 1,827,768	105	Texas ERS	\$ 21,825,644
26	Florida RS	\$ 119,981,464	106	Texas LECOS	\$ 747,673
27	Georgia ERS	\$ 11,628,507	107	Texas Municipal	\$ 20,490,600
28	Georgia Teachers	\$ 53,487,148	108	Texas Teachers	\$ 111,449,888
29	Hawaii ERS	\$ 11,293,042	109	TN Political Subdivisions	\$ 6,416,124
30	Houston Firefighters	\$ 3,175,131	110	TN State and Teachers	\$ 28,496,648
31	Idaho PERS	\$ 11,329,657	111	University of California	\$ 41,806,484
32	Illinois Municipal	\$ 27,996,328	112	Utah Noncontributory	\$ 17,629,436
33	Illinois SERS	\$ 10,960,688	113	Vermont State Employees	\$ 1,378,490
34	Illinois Teachers	\$ 36,516,824	114	Vermont Teachers	\$ 1,491,620
35	Illinois Universities	\$ 13,705,143	115	Virginia Retirement System	\$ 50,266,720
36	Indiana PERF	\$ 12,243,755	117	Washington LEOFF Plan 2	\$ 6,640,693
37	Indiana Teachers	\$ 9,077,059	119	Washington PERS 2/3	\$ 20,679,788
38	Iowa PERS	\$ 23,243,540	120	Washington School Employees Plan 2/3	\$ 2,827,286
39	Kansas PERS	\$ 13,086,743	122	Washington Teachers Plan 2/3	\$ 7,087,246
40	Kentucky County	\$ 7,054,572	123	West Virginia PERS	\$ 4,523,302
41	Kentucky ERS	\$ 3,453,658	124	West Virginia Teachers	\$ 5,144,397
42	Kentucky Teachers	\$ 14,797,121	125	Wisconsin Retirement System	\$ 81,072,320
43	LA County ERS	\$ 38,306,756	126	Wyoming Public Employees	\$ 5,904,284
44	Louisiana SERS	\$ 9,515,774	127	Arizona State Corrections Officers	\$ 1,286,979
45	Louisiana Teachers	\$ 14,188,984	128	Connecticut Municipal	\$ 1,683,442
46	Maine Local	\$ 2,033,952	129	Iowa Municipal Fire and Police	\$ 1,785,229
47	Maine State and Teacher	\$ 8,510,110	130	Louisiana Municipal Police	\$ 1,422,461
48	Maryland PERS	\$ 12,642,243	131	Louisiana Schools	\$ 1,497,109
49	Maryland Teachers	\$ 22,501,532	132	Louisiana State Parochial Employees	\$ 2,780,561
50	Massachusetts SRS	\$ 19,396,012	133	Minnesota Police and Fire Retirement Fund	\$ 5,772,047
51	Massachusetts Teachers	\$ 20,913,624	134	Oklahoma Police Pension and Retirement System	\$ 1,777,980
52	Michigan Municipal	\$ 6,872,454	135	Utah Public Safety	\$ 2,366,057
53	Michigan Public Schools	\$ 37,700,412	136	Pennsylvania Municipal Retirement System	\$ 1,661,926
54	Michigan SERS	\$ 9,272,336	137	Alameda County Employee's Retirement Association	\$ 5,085,161
55	Minneapolis ERF	\$ 842,811	138	Kern County Employees Retirement Association	\$ 2,800,024
56	Minnesota GERF	\$ 13,577,653	139	Los Angeles City Employees' Retirement System	\$ 9,098,161
57	Minnesota State Employees	\$ 9,098,097	140	Los Angeles Fire and Police	\$ 13,347,074
58	Minnesota Teachers	\$ 16,689,941	141	Los Angeles Water and Power	\$ 7,384,144
59	Mississippi PERS	\$ 19,781,388	142	Orange County ERS	\$ 9,630,264
60	Missouri DOT and Highway Patrol	\$ 1,541,404	143	Sacramento County ERS	\$ 6,073,926
61	Missouri Local	\$ 4,679,128	144	San Diego City ERS	\$ 4,710,508
62	Missouri PEERS	\$ 2,964,557	145	Chicago Municipal Employees	\$ 5,182,670
63	Missouri State Employees	\$ 7,581,883	146	Chicago Police	\$ 3,213,433
64	Missouri Teachers	\$ 27,816,772	147	Cook County Employees	\$ 8,059,936
65	Montana PERS	\$ 3,924,212	148	Boston Retirement Board	\$ 4,910,511
66	Montana Teachers	\$ 2,932,203	149	New York City Fire	\$ 8,124,677
67	Nebraska Schools	\$ 7,246,310	150	New York City Police	\$ 25,479,874
68	Nevada Police Officer and Firefighter	\$ 5,512,691	151	Milwaukee City ERS	\$ 4,377,300
69	Nevada Regular Employees	\$ 20,387,152	152	Philadelphia Municipal Retirement System	\$ 3,922,817
70	New Hampshire Retirement System	\$ 5,750,327	153	Dallas Police and Fire	\$ 3,264,931
71	New Jersey PERS	\$ 26,383,438	154	Detroit Police and Fire Retirement System	\$ 2,974,462
72	New Jersey Police & Fire	\$ 21,007,084	155	Baltimore Fire and Police Employees Retirement System	\$ 2,146,028
73	New Jersey Teachers	\$ 25,544,836	156	Seattle Employees Retirement System	\$ 1,951,435
74	New Mexico PERA	\$ 11,600,024	157	Portland Fire and Police Disability Retirement Fund	\$ 19,692
75	New Mexico Educational	\$ 9,488,961	158	Nashville-Davidson Metropolitan Employees Benefit Trust Fund	\$ 2,119,559
76	New York City ERS	\$ 42,655,336	159	Jacksonville General Employee Pension Plan	\$ 1,558,645
77	New York City Teachers	\$ 32,774,760	160	Cincinnati Employees Retirement System	\$ 2,061,896
78	New York State Teachers	\$ 88,056,264	161	Atlanta General Employees Pension Fund	\$ 1,027,769
79	North Carolina Local Government	\$ 18,651,600	162	Omaha School Employee Retirement System	\$ 1,095,565
80	North Carolina Teachers and State Employees	\$ 55,153,572	163	Baton Rouge City Parish Retirement System	\$ 961,258

Source: Boston College Center for Retirement Research, Public Pension Plans Database

Table 7 – Public Plans Governance Study Panel (Market Value in '000s), 2012

Plan ID	Plan Name	Market Value	Data Available
8	Arkansas Teachers	\$ 11,483,886	2008-2012
11	Chicago Teachers	\$ 9,437,316	2008-2012
18	Contra Costa County	\$ 5,654,581	2010
20	DC Teachers	\$ 1,503,486	2008-2012
21	Delaware State Employees	\$ 6,914,826	2008-2012
29	Hawaii ERS	\$ 11,293,042	2011-2012
32	Illinois Municipal	\$ 27,996,328	2011-2012
33	Illinois SERS	\$ 10,960,688	2009-2012
34	Illinois Teachers	\$ 36,516,824	2010-2012
36	Indiana PERF	\$ 12,243,755	2009-2012
38	Iowa PERS	\$ 23,243,540	2009-2012
39	Kansas PERS	\$ 13,086,743	2009-2012
40	Kentucky County	\$ 7,054,572	2008
49	Maryland Teachers	\$ 22,501,532	2008-2012
54	Michigan SERS	\$ 9,272,336	2009-2012
55	Minneapolis ERF	\$ 842,811	2012
64	Missouri Teachers	\$ 27,816,772	2009-2011
65	Montana PERS	\$ 3,924,212	2011-2012
67	Nebraska Schools	\$ 7,246,310	2008-2012
68	Nevada Police Officer and Firefighter	\$ 5,512,691	2008-2012
70	New Hampshire Retirement System	\$ 5,750,327	2008-2012
75	New Mexico Educational	\$ 9,488,961	2008-2012
77	New York City Teachers	\$ 32,774,760	2010-2012
93	Pennsylvania State ERS	\$ 25,389,336	2012
95	Rhode Island ERS	\$ 5,997,982	2008-2012
97	San Diego County	\$ 8,515,439	2008-2010
100	South Carolina RS	\$ 21,536,908	2011-2012
105	Texas ERS	\$ 21,825,644	2012
109	TN Political Subdivisions	\$ 6,416,124	2012
110	TN State and Teachers	\$ 28,496,648	2012
126	Wyoming Public Employees	\$ 5,904,284	2009-2012
131	Louisiana Schools	\$ 1,497,109	2008-2012
133	Minnesota Police and Fire Retirement Fund	\$ 5,772,047	2012
137	Alameda County Employee's Retirement Association	\$ 5,085,161	2012
141	Los Angeles Water and Power	\$ 7,384,144	2008-2012

Source: Data collected from meeting minutes available on each public pension plan websites.

Table 8 – Governance Database Variables

1) Name of Pension Plan	11) Date of Minutes	21) Name of Board Member	32) Present? (Yes=1, No=0)	42) Appointed (Yes=1, No=0)
2) Chair or President? (Yes=1, No=0)	12) Comptroller or Treasurer? (Yes=1, No=0)	22) Retirement or Pension Office Staff	33) Elected Employee (Yes=1, No=0)	43) Elected Retiree (Yes=1, No=0)
3) Alternate (Yes=1, No=0)	13) Alternate (Name)	23) Time Meeting Call	34) Time Meeting Adjourned	44) Length of Meeting Minutes (# pages; round up to nearest page)
4) Board Member on Investment Committee? (Yes=1, No=0)	14) Board Member on Audit or Compliance Committee? (Yes=1, No=0)	24) Other Committee #1 (Name of Committee)	35) Board Member on Other Committee #1? (Yes=1, No=0)	45) Other Committee #2 (Name of Committee)
5) Board Member on Other Committee #2? (Yes=1, No=0)	15) Investment Consultant at Meeting? (Yes=1, No=0)	25) Name of Investment Consultant Representative at Meeting	36) Number of times "performance" mentioned in minutes	46) Number of times "alert"
6) Number of times "watch"	16) Number of times "on notice"	26) Number of times "termination"	37) Number of times "fees"	47) Number of times "returns"
7) Number of times "risk"	17) Number of times "asset"	27) Number of times "allocation"	38) Number of times "adjust"	48) Number of times "pay for play"
8) Number of times "change"	18) Phone In? (Yes=1, No=0)	29) Other Committee #3 (Name of Committee)	39) Board Member on Other Committee #3? (Yes=1, No=0)	49) Other Committee #4 (Name of Committee)
9) Board Member on Other Committee #4? (Yes=1, No=0)	19) Other Committee #5 (Name of Committee)	30) Board Member on Other Committee #5? (Yes=1, No=0)	40) Other Committee #6 (Name of Committee)	50) Board Member on Other Committee #6? (Yes=1, No=0)
10) Investment Conference Interest Indicated (1=Yes, 0 = No)	20) Dollar Amount for travel	31) State	41) Multiple Boards?	51) Overriding Pension Board for Multiple Plans in Same State?

Table 9 - Legal Database Variables

1) Pension Plan Number from the Boston College Data Base	5) Case Resolved? (1=yes; 0=no)	9) Description of Resolution	15) Initial Filing (1=yes; 0=no)	20) Description of Filing
2) Court (1=federal; 0=state)	6) Name of Pension Plan	10) Date Filed	16) Defendant Type	21) Defendant Name
3) CRIMINAL Action (1=yes; 0=no)	7) Plaintiff Type	11) Plaintiff Name	17) Claim Description	22) FINRA Action (1=yes; 0=no)
4) FINRA Description	CIVIL Action (1=yes; 0=no)	12) Claim (Type)	18) DOL? (1=yes; 0=no)	23) Other Regulatory
	8) SEC? (1=yes; 0=no)	13) SEC Description	19) Case Frequency	24) Case Severity
		14) Bankruptcy (municipal)		

Step 4: Data Analysis and Testing There are two ways to test whether the index is a useful measure, in terms of both absolute and relative effectiveness. An absolute measure is binomial in nature: either the organization was effective, or it was not. If we have identified the correct factors, then the factors should be explanatory in nature. An absence of the critical factors could be indicative that the organization is bound for a fiduciary problem (e.g., underfunding, bankruptcy, litigation, etc.). A high FEQ, according to the theory, should translate into to a low ineffective score based on the two variables, case frequency and severity.

The second method of testing whether the grade is effective, on a relative, and as noted earlier, a lagged basis given the delayed effect of governance on performance outcomes observed in the data, i.e. fund returns, is a phenomenon that can be measured ongoing. How well has the organization governed itself, and then in turn performed in its investment returns and other financial measures? Theoretically, the more critical governance factors that are satisfied, the better the investment performance.

Absolute Effectiveness: The Probability of Being an Effective Organization

Our first step in analyzing the data for our effectiveness factors is determining the data whether effectiveness is conditionally present based on the combined variables. The FEQ as a rating and measurement system can only be useful if it, in fact, demonstrates some explanatory power. For this purpose, we have additionally constructed a Legal Index to evaluate each organization. This is based on a reversed scale (to be consistent with the FEQ scaling), 0-80 is ineffective and 80-100 is effective. These ranges were determined from

what was observed in the data. Plans that fell below the critical value of 0.50 for a funding ratio consistently saw Legal Index measures below 80 on the index.

We gathered legal case data, and scored qualitative data to make quantitative, to formulate a qualitative framework for integrating our aggregate data set into a broader Asset Owner Governance model as shown in **Table 1** on page 56. We subsequently refine this conceptual framework in Chapter VI into further sub-categories.

We then construct the following equation:

$FUNDR = f(FEQ, LI, X)$, where

FUNDR is the funding ratio of the pension, and is our best measure of overall effectiveness: it addresses how well funded the retirement plan is. The Legal Index (LI) variable is comprised of the frequency and severity variables. FEQ is the Fiduciary Effectiveness Quotient, and FEQ is defined by an index rating of (all or some portion) of the following factors: Structure, Process and People. X is defined as other control variables needed for the model.

An ineffective condition is defined as significant underfunded position, bankruptcy, significantly poor underperformance, criminal case, civil litigation, or significant board, committee or management reorganization. There could be any number of cases we can look at empirically to test the theory that if certain conditions are not met, then the probability of an organization being effective diminishes with each factor, as we will know in retrospect whether the organization was effective. In this case, because there were no bankruptcies in

our data set, we focused on significantly underfunded plans by which we define any plan with a funding ratio below 0.50 as significantly underfunded, and therefore ineffective.¹³²

As we note above, there are two summary variables that we have isolated to test for absolute effectiveness: 1) severity of an ineffective condition; 2) frequency of the ineffective condition.

Relative Effectiveness: The Effectiveness to Performance Link

For the final step, we use portfolio and performance data for the specified period of each organization in our sample.

We test the validity of our hypothesis that we have identified the correct effectiveness factors and compositing methodology through this analysis by examining the composite rating as the independent variable and the investment performance outcome as the dependent variable, and assess the relationship between these metrics. We will at this stage be testing the hypothesis that the governance factors, which determine fiduciary effectiveness, also impact return performance.

And so we will create and test the following regression model:

$R = f(FEQ, X)$, where,

R is the investment return, and FEQ is the Fiduciary Effectiveness Quotient defined by an index rating of the following factors: Structure, human factors and process. X represents

¹³² Fitch, a bond rating agency, defines any plan with a funding ratio below 0.60 as “weak”, the lowest category on a four point scale. https://www.actuary.org/files/80_Percent_Funding_IB_071912.pdf

several other control factors that include size of the assets, types and proportions of the investments, investment expenses, and demographic and fiscal variables.

A priori we, of course, expect there will be a strong linear relationship between these two variables. Depending on the outcome of the research, if we are successful in finding statistical support for this hypothesis, then we will have established an empirical link between fiduciary effectiveness and performance outcomes, and have a basis and methodology for quantitatively measuring, predicting, evaluating and comparing fiduciary effectiveness.

Limitations of the Study

This study represents the first foray into gathering empirical data on governance and legal activities of asset owners, specifically for public pension plans. It is, therefore, exploratory in nature, and not exhaustive in either its collection of data or in the analysis of the data. However, we have collected sufficient data on which to develop a theoretical framework around asset owner governance and fiduciary effectiveness for development of the Fiduciary Effectiveness Quotient (FEQ).

We also have no information on the individuals, particularly their backgrounds and areas of expertise, but this information could be filled in by future research using survey methods.

CHAPTER VI

ANALYSIS OF THE DATA

There are two research goals:

- 1) To understand the relationship of an organization's FEQ and investment returns (and other financial measures such as the funding ratio and bond interest cost or yield spread) of the organization's respective investment pool to link organizational structure and behavior with performance outcomes.
- 2) To assess the model in identifying and correctly categorizing plan fiduciary problems. This will be shown through a binary response (Probit) model to assess the accuracy of the model in correctly predicting (categorizing) plans as effective or ineffective.

Essentially, through this research, we are taking the *prudence is process* concept to the next level, by evaluating and measuring prudent process and tying it to direct, measurable and comparable outcomes.

Presentation of the Data

Model I: Relative Effectiveness - Selected Variables

Henceforward, when referring to the governance of institutional funds, I will use the term Fiduciary Effectiveness. Mathematically, fiduciary effectiveness may be reduced to this basic equation:

$$\text{Eq. 1: FE} = G(S, \text{Pr}, P)$$

Where, FE: Fiduciary Effectiveness
 S: Board / Committee Structure
 Pr: Process (or Engagement)
 P: People

Consistent with corporate governance theory, we have narrowed the list of variables down to a set of 17 variables for the purpose of analysis. **Table 10** shows a summary of descriptive statistics. **Tables 11-12** shows a summary of the variables, their expected and estimated signs, and related p-values, testing that the estimated coefficient does not equal zero. In general, governance variables will be proxies for the decision-making that occurs within the organization. Engagement variables such as attendance, meeting length, minutes page length and meeting frequency convey information about how active and focused the board is. Structural variables, which were first discussed in Chapter III, such as board turnover, use and attendance of the consultant and number of members likewise consider how the board is set up to interact and make decisions.

As shown in **Table 11**, using OLS we reviewed seventeen governance factors in relation to investment returns. Nine out of 17 governance factors had consistent estimated signs with expected signs. We expected the following factors would result in higher investment returns: 1) meeting length would indicate greater levels of focus and engagement; 2) more board members on the (a) audit and (b) investment committees would indicate deeper involvement; 3) more staff involvement would result in greater knowledge sharing; 4) less (a) board and (b) board chair turnover would mean greater continuity in governance; 5) fewer board members would be more effective, which would be consistent with other CG findings; and 6) involvement by the consultant through

attendance and participation would be helpful to the organization for their outside expertise and guidance.

We also constructed “Investment Discussion” as a variable, which involved key word counts within the meeting minutes as a proxy for the type and substance of the discussion. These key words included “performance”, “watch”, “returns”, “on notice”, “alert”, “fees”, “risk”, “asset”, “allocation”, “pay to play”, and “adjust”, which denote ideas around investment concepts, decisions-points, and investment governance issues. While the expected signs did not match the estimated, the results found in the quintile analysis, discussed in Chapter 7, were consistent with the theory that more key words found in the documents were common among better governed, higher performing organizations.

These data are in addition to the data available to us from the Center for Retirement Research (CRR) at Boston College. CRR, in their Public Pension Plans database, has a host of financial and actuarial data gleaned from public filings and disclosures. For our purpose, we have incorporated a number of financial variables for analytical purposes, primarily to examine investment performance. In particular, we have used three variables from this data set: 1) market assets, which represents the total asset value of the plan in nominal U.S. dollars; 2) investment returns, which are available on a rolling basis of 1, 5, and 10 years; and 3) the funding ratio, which is the market value of the assets in relation to the liabilities as measured by the actuarial Projected Benefit Obligation (PBO). We have used the one-year investment returns to examine each cross section’s factors and related performance. We have determined that a one-year forward relationship exists, and therefore have incorporated the 1-year investment return as a leading dependent variable; returns essentially lag the fiduciary process by a year. We have used market assets as a control variable for plan size.

For the control variables, as shown in **Table 12**, with the exception of investment expenses, we had no particular expectation of signs. In the case of investment expenses it was surprising on a couple of levels: 1) we expected that this would be a detractor to returns, and the opposite relationship was indicated in the estimation; and 2) the estimated coefficient was not statistically significant. The reason why this was a surprising result is because the industry has become obsessed with investment expenses over the past several years, which has fed into a debate over “active” (higher cost, research-driven and actively-managed investments) versus “passive” (lower cost, index-defined) investments, and in this case we found no such relationship to investment returns.

We have also incorporated asset allocation measures (equities, fixed income, real estate, alternative investments, and cash and cash equivalents) to account for the differences in types and proportions of investments. While governance decisions drive the investment process, investment returns are also influenced by decisions that occur at the manager level, so it is necessary to apply both sets of variables in examining the relationship to investment returns. In looking for proxies for state and municipal budgetary influences, as well as demographics of the beneficiary population, we used the actual annual contribution rates and total beneficiaries variables for each factor, respectively.

Funding of the pension through contributions has a direct relationship with the fiscal health and condition of the state (Chaney, Copley and Stone, 2002). Total beneficiaries embody both “active lives” or those still working, and “retired lives”, those who are obviously in retirement and already receiving benefit payments. These will vary based on the distribution of the beneficiary population for each plan. In preliminary analysis, these additional variables were assigned to ascertain the formulation of five final models. We applied the same set of primary and control variables in two of the models (1a. and 2 b.). The other models only required one or two primary variables in fitting a complete model,

and based on the principle of parsimony, and using a “stepwise” approach to each model, we used the fewest variables in each case to find the best “fit” for the model.

Finally, we have also examined the funding ratio as a dependent variable, consistent with the conceptual overview presented in Chapter I. To understand why all three dependent variables would be impacted by the FEQ in a similar way, one need only refer to the U.S. Public Pension System schematic on page 21 to review the theory and chain of relationships. Governance is among the set of endogenous factors that affects investment returns. Investment returns impact the funding disparity and requirements of state and local governments, as measured by the funding ratio. And as detailed in the section, “Bond Market Vigilantes: When Public Pension Governance Fails” (p. 100), we examined the relationship of pension risk to bond yield spreads to understand how the funding status of the pension system impacts the bond yield spread of related general obligation municipal bonds.

For each dependent variable, we had data available for all years 2008-2012. The source of investment returns and funding ratios was the Boston College Public Plans Database. We had 31 and 35 cross sections available for analysis, respectively. We used the Citigroup bond yield spread indexes, and had 10 cross sections in the sample available for analysis.

Table 10 – Model 1: Descriptive Statistics for a Sample of 35 Public Pension Plans (2008-2012)

Governance Variables

	Investment Return	Bond Yield Spreads	Funding Ratio	FEQ	Meeting Length	Page Length	Appointee Composition	On Audit Committee	Employee Composition	On Investment Committee	Staff Composition	Board Attendance
Mean	9.01	176.90	0.73	19.70	2.73	10.17	6.41	16.14	7.55	29.87	3.92	81.24
Median	12.70	163.74	0.72	15.08	2.41	6.70	0.00	11.11	0.00	11.11	0.00	83.33
Maximum	24.80	259.67	1.18	100.00	6.91	71.83	64.06	66.67	54.86	100.00	100.00	97.27
Minimum	-24.40	40.08	0.35	0.00	0.04	3.00	0.00	0.00	0.00	0.00	0.00	33.94
Std. Dev.	11.24	65.38	0.16	17.50	1.40	11.49	12.90	18.29	11.53	36.49	16.46	10.42
Skewness	-1.15	-0.32	0.12	2.20	0.52	3.55	3.03	0.96	1.93	0.87	5.01	-1.49
Kurtosis	4.01	2.00	3.14	8.31	3.00	15.86	12.58	2.91	7.20	2.07	27.39	6.29
Sum	1018.05	4776.29	82.41	2226.58	308.20	1148.96	724.51	1823.66	853.38	3374.89	442.57	9180.21
Sum Sq. Dev.	14146.92	111152.90	2.79	34318.67	220.44	14799.06	18625.57	37477.72	14878.60	149120.50	30346.97	12151.23
Observations	113	27	113	113	113	113	113	113	113	113	113	113

	Retiree Composition	Board Chair Turnover	Treasury Composition	Board Turnover	Board Size	Investment Discussion	Meeting Frequency	Consultant Attendance	Consultant Turnover
Mean	2.71	4.98	1.96	20.22	11.00	20.17	10.07	0.56	0.21
Median	0.00	0.00	0.00	14.29	11.00	9.45	10.00	0.67	0.00
Maximum	25.00	183.33	16.67	93.75	22.00	228.42	26.00	1.00	1.00
Minimum	0.00	0.00	0.00	0.00	6.00	0.00	2.00	0.00	0.00
Std. Dev.	6.64	17.86	3.69	23.74	3.29	35.95	3.77	0.37	0.41
Skewness	2.27	8.95	1.70	1.57	0.54	4.21	0.75	-0.32	1.41
Kurtosis	6.71	89.61	5.04	5.03	3.36	21.82	5.14	1.61	2.98
Sum	306.59	562.75	221.23	2284.86	1243.00	2278.66	1138.00	63.41	24.00
Sum Sq. Dev.	4932.56	35727.83	1525.02	63100.08	1214.00	144788.80	1593.43	15.43	18.90
Observations	113	113	113	113	113	113	113	113	113

Control Variables

	Market Asset Value	Equities	Fixed Income	Real Estate	Cash	Alternatives	Investment Expense	Total Beneficiaries	Annual Contribution Rate
Mean	10,966,949	0.52	0.28	0.05	0.03	0.12	-47558.17	40212.69	0.31
Median	8,375,970	0.54	0.28	0.05	0.02	0.10	-30543.97	26363.50	0.21
Maximum	37,471,268	0.65	0.45	0.16	0.11	0.57	-1079.00	121927.00	7.75
Minimum	842,811	0.12	0.13	0.00	0.00	0.00	-326523.10	2391.00	0.06
Std. Dev.	8,544,207	0.10	0.07	0.04	0.03	0.09	56103.65	31709.95	0.75
Skewness	1.3	-1.67	0.12	0.10	1.26	1.82	-2.54	0.94	9.65
Kurtosis	3.9	6.92	2.71	2.37	4.22	8.39	10.14	2.75	96.02
Sum	1.E+09	58.47	31.48	5.86	3.12	13.30	-5.E+06	4.E+06	31.24
Sum Sq. Dev.	8.E+15	1.02	0.49	0.15	0.08	0.99	3.E+11	1.E+11	57.16
Observations	113	113	113	113	113	113	102	102	102

Investment Return is the 1-year return. Bond Yield Spread is the difference in the index yield of the given plan's municipality's general obligation bonds and the referenced broad index yield for similar duration general obligation municipal bonds. Funding Ratio is the ratio of plan assets to projected liabilities. FEQ is the Fiduciary Effectiveness Quotient, an index variable composed of 17 governance variables. Meeting Length is duration in hours. Page length is the number of minutes pages. Appointee Composition is the percentage of appointees on the board. Audit Committee is the percentage of board members on the committee. Employee Composition is the percentage of employees on the board. Investment Committee is the percentage of board members on the committee. Staff Composition is the percentage of staff attending the meeting. Board Attendance is the percentage of board members attending the meeting. Retiree Composition is the percentage of retirees on the board. Board Chair Turnover is expressed as the percentage of board size, e.g., if the board chair turned over every year and the board were ten people, the percentage would be 10%, every two years 5%, etc. Treasury Composition is the percentage of the board represented by the treasurer and staff. Board Turnover is also expressed as a percentage of board size. Investment Discussion is the number of key words counted in each meeting minutes. Meeting Frequency is the number of board meetings per year. Consultant Attendance is the percentage of meeting attendance by the consultant. Consultant Turnover is expressed as a ratio of number of consultants per year. Market Asset Value is the value of the pension plan assets in nominal dollar terms. Equities, Fixed Income, Real Estate, Cash and Alternatives are expressed as a percentage of the portfolio allocation. Investment Expenses are total investment manager fees and expenses in dollars. Total Beneficiaries are the total number of beneficiaries covered by each plan. Annual Contribution Rate is the percentage of covered plan compensation. All financial variables are from the Boston College Center For Retirement Research with the exception of bond yield spreads, which are from Citigroup. All governance variables are collected from meeting minutes available on public pension plan websites.

Table 11 – Model 1: Selected Governance Variables for a Sample of 35 Plans, (2008-2012)

Variable	Description	Expected Signs	Estimated Signs	P Value	Reject / Not Reject
Fiduciary Effectiveness Quotient (FEQ)**	Fiduciary Effectiveness Index	+	+	0.0124	Not Reject
Meeting Length**	Duration hours – amount of time consumed for meeting	+	+	0.0639	Not Reject
Page Length	Number of meeting minutes pages	+	-	0.4467	Reject
Appointees Composition	Percentage of board comprised of political appointees	-	+	0.6053	Reject
Board Members on Audit Committee**	Percentage of board on the audit committee	+	+	0.0034	Not Reject
Employee Composition**	Percentage of board comprised of employees	+	+	0.0007	Not Reject
Board Members on Investment Committee	Percentage of board on the investment committee	+	-	0.5839	Reject
Staff Composition**	Percentage of attendees comprised of staff	+	+	0.0246	Not Reject
Board Attendance	Percentage of board present	+	-	0.0424	Reject
Retiree Composition	Percentage of board comprised of retirees	-	+	0.1264	Reject
Board Chair Turnover**	Percentage turnover of the board chair	-	-	0.1490	Reject
Treasury Composition	Percentage of attendees comprised of treasury officials	+	-	0.1048	Reject
Board Turnover**	Percentage turnover of board members	-	-	0.1490	Reject
Board Size**	Total board membership size	-	-	0.0228	Not Reject
Investment Discussion	Key word counts on investing	+	-	0.8234	Reject
Meetings Frequency	Total number of meetings	+	-	0.9363	Reject
Consultant Attendance**	Percentage attendance of consultants	+	+	0.0093	Not Reject
Consultant Turnover	Percentage turnover of consultants	-	+	0.7941	Reject

Reject above the 10% statistical significance level using the t-test. **One tail test.

Investment Return is the 1-year return. Bond Yield Spread is the difference in the index yield of the given plan's municipality's general obligation bonds and the referenced broad index yield for similar duration general obligation municipal bonds. Funding Ratio is the ratio of plan assets to projected liabilities. FEQ is the Fiduciary Effectiveness Quotient, an index variable composed of 17 governance variables. Meeting Length is duration in hours. Page length is the number of minutes pages. Appointee Composition is the percentage of appointees on the board. Audit Committee is the percentage of board members on the committee. Employee Composition is the percentage of employees on the board. Investment Committee is the percentage of board members on the committee. Staff Composition is the percentage of staff attending the meeting. Board Attendance is the percentage of board members attending the meeting. Retiree Composition is the percentage of retirees on the board. Board Chair Turnover is expressed as the percentage of board size, e.g., if the board chair turned over every year and the board were ten people, the percentage would be 10%, every two years 5%, etc. Treasury Composition is the percentage of the board represented by the treasurer and staff. Board Turnover is also expressed as a percentage of board size. Board Size is the number of board members. Investment Discussion is the number of key words counted in each meeting minutes. Meeting Frequency is the number of board meetings per year. Consultant Attendance is the percentage of meeting attendance by the consultant. Consultant Turnover is expressed as a ratio of number of consultants per year. Source: Public pension plan meeting minutes available on plan web sites.

Table 12 – Model 1: Selected Control Variables for a Sample of 35 Plans (2008-2012)

Variable	Description	Expected Signs	Estimated Signs	P Value	Reject / Not Reject
Market Asset Value	Market asset value	+/-	-	0.0000	Not Reject
Equities	Equity investment allocation	+/-	-	0.0033	Not Reject
Fixed Income	Fixed income investment allocation	+/-	-	0.8792	Reject
Real Estate	Real estate investment allocation	+/-	-	0.7211	Reject
Cash	Cash and equivalent investment allocation	+/-	-	0.1332	Reject
Alternatives	Alternatives investment allocation	+/-	-	0.8889	Reject
Investment expenses	Investment expenses and fees	-	+	0.0898	Not Reject
Total Beneficiaries	Total number of beneficiaries	+/-	+	0.0000	Not Reject
Annual Contribution Rate	Required annual contribution rate	+/-	+	0.0029	Not Reject

Reject above the 10% statistical significance level using the t-test. **One tail test.

Market Asset Value is the value of the pension plan assets in nominal dollar terms. Equities, Fixed Income, Real Estate, Cash and Alternatives are expressed as a percentage of the portfolio allocation. Investment Expenses are total investment manager fees and expenses in dollars. Total Beneficiaries are the total number of beneficiaries covered by each plan. Annual Contribution Rate is the percentage of covered plan compensation. All financial variables are from the Boston College Center For Retirement Research.

In addition to testing the hypothesis that there is no relationship between fiduciary effectiveness factors and investment returns (Model 1a), we have also incorporated the same analysis by examining both bond yield spreads (Model 1b) and the funding ratio (Model 1c) as dependent variables, separately. Referring back to **Figure 1** on page 20, stronger forms of fiduciary effectiveness should result in higher investment returns. All other things being equal, higher investment returns should drive stronger funding ratios, and stronger funding ratios overall should result in less aversion among municipal bond investors to related municipal bonds. In theory, the end result should be lower bond yield spreads; and in other words, lower interest costs on outstanding bond issues.

Model I: Relative Effectiveness – Specification and Tests

When working with unbalanced panel data with a large number of regressors (17 governance factors), but with a limited time series (five years of annual periods) there are a number of steps that must be taken to ensure the model is correctly specified to handle the potential cross-section effects. As we noted earlier, an unbalanced panel is one where there are missing observations, in this case due to the inconsistency of reporting by the public pensions both in points of time of when they report and what they report. Because their meeting minutes are obviously determined by when the boards meet – and every organization maintains their own meeting schedule, which, of course, varies by organization – this created an unbalanced panel sample. Additionally, there were some years when minutes for a number of plans were not available.

We first undertook an OLS regression to begin examining the data. We applied the Hausman test to test whether the model is subject to fixed or random effects. In this case, it was clear that the model would be subject to fixed effects when running the comparison

test. The Chi-squared statistic had a p-value of 0.0000, which required strongly rejecting the null hypothesis that the model was subject to random effects. We then checked for redundancy among the instrumental variables by applying the fixed effects redundancy test, and again our cross-section F and Chi-squared statistics both had p-values of 0.0000, strongly supporting non-redundancy of fixed effects among cross sections. This is important because we do not want to subject the model to omitted variable bias.

Next, we applied the White diagonal co-efficient covariation method for correcting for heteroscedasticity, which is a common problem with panel data. This did not, however, address the issue of multicollinearity one encounters when applying a large number of regressors within a multivariate equation.

Principal Components Analysis (PCA or Factor Analysis) is one method for addressing multicollinearity among regressors. A data reduction technique, it seeks to explain observable phenomena with a fewer number of variables. By reducing the number of variables to their “principle components”, the essential statistical properties are preserved, without the repetitive and potentially distortive effects of multicollinearity (i.e., sign reversal or over-estimated standard errors.) It also has the additional benefit of making possible the summarization of factors to a manageable index term, which can then be applied to comparative peer group analysis (i.e., through separation of economic units into quintiles), which was one goal of the research. One drawback to the use of the PCA method is that, in general, regressors can bias the results (Enns, 1979). See **Table 13 (a.-b.)** for the Principal Component Extraction based on an Eigenvalue of 1 or greater and the PCA factor loadings and interpretation of the components.

In this case, we analyzed the seventeen governance variables using PCA. This generated 17 factor loadings. We applied the Kaiser Criterion to extract our Eigenvectors. By this we mean, we determined our principal component factor selection by eliminating

any factor with an Eigenvalue less than 1. This generated six components that captured 69% of the total variance of all 17 variables. Once we had our factor loadings we were able to combine the loadings with each variable, and then apply PCA-determined weights to each new factor. This was done after applying a Varimax rotation. Any individual factor that had an Eigenvalue of 0.20 or greater was considered as containing meaningful, relevant information for the principal component and helped in the interpretation. The principal components are summarized here:

(F1) Professionalism – This principal component may be interpreted as the level of professionalism within the organization. It is comprised of consultant attendance, meeting duration, page length of the minutes, board participation on the audit committee, employee composition, board participation on the investment committee and investment discussion.

(F2) Board Composition – This principal component may be interpreted as the composition and capacity of those serving on the board. It is comprised of appointee composition, employee composition, board attendance and retiree composition.

(F3) Engagement – This principal component may be interpreted as the degree of engagement by the board members, staff and consultant. It is comprised of consultant attendance, staff composition, board attendance and board chair turnover.

(F4) Staff – This principal component may be interpreted as the extent of involvement by professional staff. It is comprised of staff composition and treasury composition.

(F5) Institutional Knowledge – This principal component may be interpreted as the continuity within the organization of its institutional knowledge. It is comprised of appointee composition, board turnover, board size and consultant turnover.

(F6) Diligence – This principal component may be interpreted by the extent of the diligence and thoroughness of the organization in exercising its governance process. It is

comprised of consultant attendance, page length of meeting minutes, treasury composition and investment discussion.

The weighted combination of these principal components ultimately constituted our index for each plan and year for a total of 35 Plans and 113 observations. Each variable was standardized prior to combination. Once the variables were reduced to a single index, we could then normalize or scale the index to reinterpret the index values on a scale of 0-100. This final step allowed the ranking and segmentation of cross-sections into quintile groupings for further analysis and comparison.

Table 13a. – Principal Component Extraction Using the Kaiser Criterion (Eigenvalue Greater than One), Reduction of 17 Governance Factors to Six Principal Components for a Sample of 35 Pension Plans, 2008-2012

Eigenvalues: (Sum = 17, Average = 1)

Number	Value	Difference	Proportion	Cumulative Value	Cumulative Proportion
1	3.479836	1.180541	0.2047	3.479836	0.2047
2	2.299295	0.582583	0.1353	5.779131	0.3399
3	1.716712	0.066430	0.1010	7.495842	0.4409
4	1.650281	0.224510	0.0971	9.146123	0.5380
5	1.425771	0.269639	0.0839	10.57189	0.6219
6	1.156132	0.190467	0.0680	11.72803	0.6899
7	0.965665	0.081805	0.0568	12.69369	0.7467
8	0.883860	0.164519	0.0520	13.57755	0.7987
9	0.719340	0.072677	0.0423	14.29689	0.8410
10	0.646664	0.150619	0.0380	14.94355	0.8790
11	0.496045	0.087096	0.0292	15.43960	0.9082
12	0.408949	0.060703	0.0241	15.84855	0.9323
13	0.348246	0.032862	0.0205	16.19679	0.9528
14	0.315384	0.061633	0.0186	16.51218	0.9713
15	0.253751	0.064482	0.0149	16.76593	0.9862
16	0.189269	0.144467	0.0111	16.95520	0.9974
17	0.044802	---	0.0026	17.00000	1.0000

Table 13b. – PCA Factor Loadings and Descriptions for a Sample of 35 Public Pension Plans, 2008-2012

Eigenvectors (loadings):

Variable	F1 PROFESSIONALISM	F2 BOARD COMPOSITION	F3 ENGAGEMENT	F4 STAFF	F5 INSTITUTIONAL KNOWLEDGE	F6 DILIGENCE
Consultant Attendance	0.20167	-0.35485	0.296089	0.022429	-0.156851	0.270038
Meeting Length	0.31674	-0.183035	-0.035747	-0.099442	-0.105578	-0.117912
Page Length	0.481462	0.107649	-0.046327	-0.088895	0.101081	0.217728
Appointee Composition	-0.100938	0.49792	0.07179	-0.143892	0.254281	0.082751
Members on Audit	0.390887	0.085559	-0.070833	0.179205	0.012845	-0.039565
Employee Composition	0.342396	0.308711	-0.161528	0.105109	0.187257	0.041429
Members on Investment	0.291348	0.008718	-0.120038	0.055951	-0.145885	-0.469485
Staff Composition	-0.007464	-0.050076	0.387652	0.548569	0.082912	0.198688
Board Attendance	0.108416	0.328723	0.234105	-0.365364	-0.216942	-0.087215
Retiree Composition	-0.137818	0.42396	0.160074	0.3092	0.153039	0.143249
Board Chair Turnover	-0.007237	-0.19	0.261172	-0.259232	0.117989	0.001436
Treasury Composition	-0.058854	-0.094901	-0.335382	0.206969	-0.37604	0.27057
Board Turnover	-0.040989	-0.33842	-0.01786	-0.022783	0.539119	0.168518
Board Size	-0.009606	-0.072723	-0.590289	0.160405	0.323791	-0.058492
Investment Discussion	0.424635	0.025089	0.018508	-0.05834	0.010803	0.440987
Consultant Turnover	0.117985	-0.14583	0.15546	-0.211002	0.450661	-0.229631

Factor loadings descriptions based on a minimum Eigenvector of 0.20. Varimax was the rotation method used. Data in table represents 35 plans and 113 observations for the years 2008-2012. Governance factors are comprised of: 1) Meeting Length is duration in hours; 2) Page length is the number of minutes pages; 3) Appointee Composition is the percentage of appointees on the board; 4) Audit Committee is the percentage of board members on the committee; 5) Employee Composition is the percentage of employees on the board; 6) Investment Committee is the percentage of board members on the committee; 7) Staff Composition is the percentage of staff attending the meeting; 8) Board Attendance is the percentage of board members attending the meeting; 9) Retiree Composition is the percentage of retirees on the board; 10) Board Chair Turnover is expressed as the percentage of board size, e.g., if the board chair turned over every year and the board were ten people, the percentage would be 10%, every two years 5%, etc; 11) Treasury Composition is the percentage of the board represented by the treasurer and staff; 12) Board Turnover is also expressed as a percentage of board size; 13) Board Size is the number of board members; 14) Investment Discussion is the number of key words counted in each meeting minutes; 15) Meeting Frequency is the number of board meetings per year; 16) Consultant Attendance is the percentage of meeting attendance by the consultant; 17) Consultant Turnover is expressed as a ratio of number of consultants per year. Source: Public pension plan meeting minutes available on plan web sites.

Model I: Relative Effectiveness – Regression Models (1a-1c)

Now that we had a single standardized index measure, it was time to re-estimate our regression model with the specifications outlined above. **Table 14** shows the estimation results for investment returns:

$$\text{Eq. 2: } R(Y)_{\text{citi}+1} = C + B_1 \text{FEQ}(X_1)_{\text{citi}} + B_2 \text{MVA}(X_2)_{\text{citi}} + B_3 \text{Eq}(X_3)_{\text{citi}} + B_4 \text{Fx}(X_4)_{\text{citi}} + \\ B_5 \text{Re}(X_5)_{\text{citi}} + B_6 \text{A}(X_6)_{\text{citi}} + B_7 \text{CCE}(X_7)_{\text{citi}} + B_8 \text{IE}(X_8)_{\text{citi}} + B_9 \text{BN}(X_9)_{\text{citi}} + B_{10} \text{RC}(X_{10})_{\text{citi}} + \mu$$

Where,

$R_{\text{ti}+1}$: One year forward investment return

C: Constant

FEQ: Fiduciary Effectiveness Index (FEQ) (S_INDEX)

MVA: Market Asset Value (MKTASS)

Eq: Equity allocation (EQUITIES_TOTSA)

Fx: Fixed income allocation (FIXEDINCOME_TOTSA)

Re: Real estate allocation (REALESTATESA)

A: Alternative investment allocation (ALTERNATIVESSA)

CCE: Cash and cash equivalent allocation (CASHANDSHORTTERMSA)

IE: Investment expenses (EXPENSE_INVESTMENTSSA)

BN: Total beneficiaries (BENEFICIARIES_TOTSA)

RC: Required contribution rate (REQCONTRATE_TOTSA)

ci: Cross-section (Plan)

ti: Time period (Annual)

μ : Random error term

The dependent variable is the one-year forward return, to allow for a one-year lag in the regressor. This reflects the point that fiduciary activities do not immediately have an impact (e.g., managers are hired and fired over time, allocations may change periodically,

etc.) Also, to fill out our model, the inclusion of some additional demographic, actuarial and financial factors reduced the number of common cross-sections to 31(102 observations).

The control variables chosen for the model were selected to capture the additional effects that also determine investment returns. Market asset value, or plan size, represents the total assets in the plan. The size of the plan may impact the types of investments available to the plan or the direction of those investments. Asset allocation percentages related to equities, fixed income, real estate and alternatives were also chosen. Differences in asset allocation can have a large impact on investment returns. Brinson, Hood and Beebower (1986) assert that asset allocation is the primary determinant of portfolio performance. We also incorporated investment expenses. Many across the industry, such as the investment firm Vanguard, believe that investment expense is also a key driver of investment return.¹³³ Finally, we selected total beneficiaries and required contribution rates, two actuarial variables, to capture differences in plan populations and funding requirements, which we considered also potentially influential in investment decision-making.

With the exception of investment expenses and required contribution rate, every coefficient estimate associated with the regressor is statistically significant below the 3% level using a one-tail test for the primary variable (FEQ) and a two-tail test for the control variables. The model based on the F-Statistic is statistically significant below the 1% level. This combination of factors explains 69% of the variation in one-year forward returns (R-squared). The expected and estimated signs for the FEQ were consistent, an increase in the FEQ is related to an increase in returns. The FEQ coefficient may be interpreted as follows: A one-unit change in the index is associated with a 0.36% change in investment return when all other variables are held constant.

¹³³ <https://personal.vanguard.com/us/insights/investingtruths/investing-truth-about-cost>

Table 14 (1a.) – The FEQ in Relation to Pension Plan Investment Returns for a Sample of 31 Public Pension Plans, 2008-2012*

Variable	Coefficient	Std. Error	T-Statistic	P-Value
Constant	80.039	15.643	5.117	0.000
FEQ**	0.360	0.156	2.312	0.012
Market Asset Value	-5.64E-06	1.03E-06	-5.448	0.000
Equities	-24.525	4.706	-5.211	0.000
Fixed Income	-9.873	3.491	-2.828	0.006
Real Estate	-16.904	6.287	-2.689	0.009
Alternatives	-16.150	5.886	-2.744	0.008
Cash and Equivalents	-5.021	1.764	-2.846	0.006
Investment Expense	1.723	3.657	0.471	0.639
Total Beneficiaries	149.673	46.097	3.247	0.002
Required Contribution Rate	14.586	9.959	1.465	0.148

R-squared	0.686	Mean dependent var.	8.726
Adj. R-squared	0.480		
F-statistic	3.335	Five periods only	
Prob.(F-Statistic)	0.000	N=102	

*One-year forward investment returns

**One-tail test

Measures are expressed as: Investment returns in annual percentage total return (capital gains and income); FEQ in scaled index units. The rest are in standardized form: Market Asset Value in thousands of U.S. dollars; Equities, Fixed Income, Real Estate, Alternatives and Cash and Equivalents as a percent of the total investment allocation; Investment Expense in U.S. dollars; Total Beneficiaries in number of people; and Required Contribution Rate as a percentage of covered plan compensation.

Having demonstrated statistical evidence of a relationship of the FEQ with investment performance, we turn now to the other dependent variables to continue our exploration of the potential far-reaching impact of fiduciary effectiveness. The next model examines the relationship between the FEQ and bond yield spreads.

Beginning, of course, with our focal variable, the FEQ, which as noted above, is a summary of 17 governance variables, it was not necessary to use control variables in this case, as we were able to explain most of the variation in the dependent variable with the FEQ index alone. See **Table 15 (1b)** for estimation results. Here is the regression equation:

$$\text{Eq. 3: } BY(Y)_{citi} = C + B_1 FEQ(X_1)_{citi} + \mu$$

Where, BY: Bond Yield Spread (BNDYLDS)

C: Constant

FEQ: Fiduciary Effectiveness Index (FEQ)

ci: Cross-section (Plan)

ti: Time period (Annual)

μ : Random error term

Here, we are more limited in terms of available bond yield spread data.¹³⁴ Over the last few years there have been some new municipal bond yield indexes that have become available for several states and larger municipalities, but this only represents 10 cross-sections in our data set (27 observations). Table 14 provides a description of the bond yield spread statistics.

¹³⁴ Source: Citigroup

Table 15 (1b) – The FEQ in Relation to Municipal Bond Yield Spreads for a Sample of 10 Public Pension Plans

Variable	Coefficient	Std. Error	T-Statistic	P-Value
Constant	42.793	62.729	0.682	0.505
FEQ**	5.645	2.527	2.234	0.020

R-squared	0.908	Mean dependent var.	176.900
Adj. R-squared	0.851		
F-statistic	15.828	Five periods only	
Prob.(F-Statistic)	0.000	N=27	

**One tail test

Measures are expressed as: Bond yield spreads are in basis points (1 bp = 0.01%); FEQ in scaled index units.

The estimated coefficient of the FEQ is statistically significant at the 2% level. The model comprised of the one regressor is significant below the 1% level. This factor explains 91% of the variation in bond yield spreads (R-squared).

I was expecting an inverse relationship i.e., a one-unit increase in the FEQ would mean a commensurate decrease in the bond yield spread, but the sign was positive. In other words, my expectation was that better governance would translate into lower yield spreads. Here this was not to be the case, and yet in our quintile analysis described in the next chapter, we did find such differences among the groupings, albeit somewhat inconsistently across peer groups, and again this may be due to a couple of factors. First, we had limited data availability for this analysis, and secondly, as noted earlier, and as shown especially in **Figure 8** on page 106, investors during the study period were not as attune to pension risk, which came after especially starting in early 2013. So, what I conclude is that there is strong evidence of a relationship, although the direction of that relationship was not consistent either in the available data, during the study period or both.

Finally, and in summary from the model estimation, the FEQ coefficient may be interpreted as follows: A one-unit change in the index is associated with a 5.6 basis point change in the bond yield spread. Bond yield spreads are measured in basis points (i.e. 1% = 100 basis points or bps).

The final model under relative effectiveness examines the relationship between the FEQ and the funding ratio (**Table 16 (1c)**). Here we have no data limitation and may make use of our complete sample of 35 cross-sections (113 observations):

$$\text{Eq. 4: } FR(Y)_{\text{citi}} = C + B_1 FEQ(X_1)_{\text{citi}} + \mu$$

Where, FR: Funding Ratio (FUNDR)

C: Constant

FEQ: Fiduciary Effectiveness Index (FEQ)

ci: Cross-section (plan)

ti: Time period (annual)

μ : Random error term

Table 16 (1c.) The FEQ in Relation to Pension Plan Funding Ratios for a Sample of 35 Public Pension Plans

Variable	Coefficient	Std. Error	T-Statistic	P-Value
Constant	0.811	0.024	34.038	0.000
FEQ**	-0.004	0.001	-3.672	0.000

R-squared 0.926 Mean dependent var. 0.729

Adj. R-squared 0.892

Prob.(F-Statistic) 0.000

Five periods only
N=113

**One tail test

Measures are expressed as: Funding ratio, total assets in relation to total projected liabilities (e.g. 0.70 is 70%.) FEQ in scaled index units.

The estimated coefficient of the FEQ is statistically significant below the 1% level. The model comprised of the one regressor is significant below the 1% level, and explains 93% of the variation in the funding ratio (R-squared). Here again I expected the sign to be positive, that if the FEQ increases in value, then the funding position of the pension should increase, but the results were slightly negative. This may be explained by the fact that the coefficient estimate is so close to zero, which was true both for the FEQ, and in the next section, the Legal Index, the former having a negative value and the latter a positive value, which was consistent with the theory. The quintile analysis also gave somewhat inconsistent results across peer groups. The FEQ coefficient may be interpreted as follows: A one-unit change in the index is associated with a -0.004 change in the funding ratio. Pension funding ratios are measured in decimals, but can be interpreted as a percent (i.e. 0.70 is 70%).

Appendix B provides a quintile breakdown of the governance factors, factor by factor, which generated many of the key findings discussed in the next and final chapter.

Model II: Absolute Effectiveness - Selected Variables

Working with the Marquette Law School, we collected case information during the study period on available legal and regulatory case for almost every plan included in the BC database (153), regardless of whether the plan is noted in the case as the defendant or plaintiff. Using these data, we have constructed four variables for examination relative to fiduciary effectiveness: case severity; total case frequency; defendant case frequency; and plaintiff case frequency. As we indicated, two main factors, how often cases occur and the quality of the cases involved, may be indicators of how severe a system may be under financial and ultimately legal stress. See **Table 17** for case distributions by plan across all

study years, 2008-2012. The inclusion of the defendant and plaintiff variables help distinguish between “good” legal activity, where the board is diligently protecting its rights versus “bad” legal activity, where the questions of fairness and equity keep recurring – and potentially growing – between stakeholders and the plan.

Table 17 – Legal Case Distribution by Pension Plan and Year

Plan Number	Name of Pension Plan	2008	2009	2010	2011	2012	Total
1	Alabama ERS	3			1	1	5
2	Alabama Teachers	1	1				2
3	Alaska PERS	1	3				4
4	Alaska Teachers	1	3				4
5	Arizona Public Safety Personnel		1	3	3	2	9
6	Arizona SRS	1	5	4	3	4	17
7	Arkansas PERS	1	1		2	4	8
8	Arkansas Teachers	3	4	6	6	8	27
9	California PERF	13	23	18	24	28	106
10	California Teachers	3	10	4	11	11	39
11	Chicago Teachers	5	2	1	3	4	15
12	City of Austin ERS						0
13	Colorado Municipal		1	1	1		3
14	Colorado School		1	1	1		3
15	Colorado State		1	1	1		3
16	Connecticut SERS	2	5	2	4	3	16
17	Connecticut Teachers	1	3	1		2	7
18	Contra Costa County	1	1		2	2	6
19	DC Police & Fire		1		2	1	4
20	DC Teachers		1		2	1	4
21	Delaware State Employees					3	3
22	Denver Employees	1		2	2	3	8
24	Duluth Teachers	1					1
25	Fairfax County Schools						0
26	Florida RS	1	3	3	3	3	13
27	Georgia ERS	3	1	2	1		7
28	Georgia Teachers	4	1	6	8	12	31
29	Hawaii ERS	2	1	1	1	2	7
30	Houston Firefighters		1		1	1	3
31	Idaho PERS			1	4		5
32	Illinois Municipal	1	2	1		4	8
33	Illinois SERS					1	1
34	Illinois Teachers	5	8	3	3	3	22
35	Illinois Universities	1	2	2			6
36	Indiana PERF			1		1	2
37	Indiana Teachers	1	6		1		8
38	Iowa PERS	5	11	2	2	2	22
39	Kansas PERS	3		1	2	4	10
40	Kentucky County	30	46	26	33	25	160
41	Kentucky ERS	30	46	26	33	25	160
42	Kentucky Teachers						0
43	LA County ERS	1	1	2	5	4	13
44	Louisiana SERS	1	2	1	3		7
45	Louisiana Teachers	1	3		3		7
46	Maine Local	2		1		1	4
47	Maine State and Teacher	2		1		1	4
48	Maryland PERS	5	7	5	10	8	35
49	Maryland Teachers			4	3	1	8
50	Massachusetts SERS	5	1	7	1	2	16
51	Massachusetts Teachers	10	7	13	4	4	38
52	Michigan Municipal	1	1	1	3	3	9
53	Michigan Public Schools	3	1	2	5	2	13
54	Michigan SERS	5	5	9	7	5	31
55	Minneapolis ERF			2	3	1	6
56	Minnesota PERF	5	1	3	4	4	17
57	Minnesota State Employees	1		2	2	1	6
58	Minnesota Teachers	1		2			3
59	Mississippi PERS	17	15	13	9	4	58
60	Missouri DOT and Highway Patrol			1			1
61	Missouri Local		3	1	2	1	7
62	Missouri PEERS		5	9	2	1	17
63	Missouri State Employees	9	5	6	1	1	22
64	Missouri Teachers (see BC 62)						0
65	Montana PERS	1		1	2	1	5
66	Montana Teachers	1		1	2	1	5
67	Nebraska Schools			2	1		3
68	Nevada Police Officer and Firefighter				2	1	3
69	Nevada Regular Employees		1	1	2	1	5
70	New Hampshire Retirement System	2	1	5	4	1	13
71	New Jersey PERS		2	1			3
72	New Jersey Police & Fire		1	1			2
73	New Jersey Teachers		1	1			2
74	New Mexico PERF	2	5	5	3	3	18

Plan Number	Name of Pension Plan	2008	2009	2010	2011	2012	
75	New Mexico Teachers	2	2	5	4	37	50
76	New York City ERS	15	21	13	17	10	76
77	New York City Teachers	8	2	5	6	8	29
78	New York State Teachers	13	12	8	2	3	38
79	North Carolina Local Government	4	1		1	1	7
80	North Carolina Teachers and State Employees	3	3	1	3	2	12
81	North Dakota PERS						0
82	North Dakota Teachers						0
83	NY State & Local ERS	22	42	46	28	14	152
84	NY State & Local Police & Fire	1	1	3			5
85	Ohio PERS	9	6	9	9	12	45
86	Ohio Police & Fire	1	2	1	3	4	11
87	Ohio School Employees	1	1	1	1	4	8
88	Ohio Teachers	5	5	6	8	4	28
89	Oklahoma PERS	2	1			2	5
90	Oklahoma Teachers	7	2				9
91	Oregon PERS		1		4		5
92	Pennsylvania School Employees	7		2	5		14
93	Pennsylvania State ERS	2	5	4	2	2	15
94	Phoenix ERS	1					1
95	Rhode Island ERS		2	1	7	1	11
96	Rhode Island Municipal		2	1	7	1	11
97	San Diego County		3	3	5	8	19
98	San Francisco City & County	2	1	2	2	4	11
99	South Carolina Police			2			2
100	South Carolina RS	4	2	4	2	1	13
101	South Dakota PERS				1		1
102	St. Louis School Employees	1	2	1		1	5
103	St. Paul Teachers		1				1
104	Texas County & District		2	1			3
105	Texas ERS	6	8	10	3	9	36
106	Texas LECOS	6	8	10	4	9	37
107	Texas Municipal						0
108	Texas Teachers	2	3	3	6	4	18
109	TN Political Subdivisions	16			2		18
110	TN State and Teachers	16			2		18
111	University of California			1	3		4
112	Utah Noncontributory	1	1	2	2	2	8
113	Vermont State Employees	1	2	2	3	2	10
115	Virginia Retirement System	6	20	24	13	14	77
119	Washington PERS 2/3		1	2	3		6
121	Washington Teachers Plan 2/3		6	4	5	3	18
124	West Virginia Teachers	1	5	2	1	2	11
126	Wyoming Public Employees		1	1	3	2	7
128	Connecticut Municipal Employees Retirement System {MERS}	1	3	1		2	7
130	Louisiana Municipal Police Employees Retirement System {MPERS}	11	12	16	22	28	89
132	Louisiana State Parochial Employees Retirement System {PERS}				1		1
134	Oklahoma Police Pension and Retirement System {Police System}	3	2	2	5	5	17
136	Pennsylvania Municipal Retirement System Kern County Employees Retirement Association {KCERA}	1			2	1	4
138	Los Angeles City Employees Retirement System {LACERS}	2	5		1		8
139	Los Angeles Fire and Police Pension System {Pensions}			3	3	2	11
140	Los Angeles Water and Power Employees Retirement Plan {DWP}			1			1
141	Orange County Employees Retirement System {ERS}	3	5	1	4	3	16
142	Sacramento County Employees Retirement System {The System}	4	1	6	8	2	21
143	San Diego City ERS	3	6	2	5	3	19
144	Chicago Municipal Employees Annuity Benefit Fund {"The Plan"}		1	2		3	6
145	Chicago Police	10	15	7	6	7	45
146	Cook County Employees Annuity Benefit Fund {CEABF}		5	5	1	1	12
147	Boston Retirement Board	12	11	4	2	3	32
148	New York City Fire Dept Article 1B Pension Fund	4	2	2	3	1	12
149	New York City Police Pension Fund Article 2	13	5	18	24	10	70
150	Milwaukee City Employees Retirement System {The System}		3	1	1	1	6
151	Philadelphia Municipal Pension Plan	1	1	1			3
152	Dallas Police and Fire		1	1	3	1	6
153							
Grand Total		445	543	491	526	462	2467

Therefore, I constructed a Legal Index based on the following equation:

Eq. 2: $LI = H(CS, CF)$

Where, LI: Legal Index
 CS: Case Severity
 CF: Case Frequency

As introduced in Chapter II, I have developed a qualitative case severity framework, which has been further refined and expanded to incorporate the many varieties of cases encountered in this area of the law. These range from fraud on one extreme to minor statutory duties of plan operations on the other. These were expanded to cover the following categories, in order of declining severity: investments: fraud; investments: breach of fiduciary duty/ contract; benefit management/disbursement; plan operations; minor statutory duties concerning operations; alterior investment concerns; and undefined. **Table 18** provides detail on the refined severity measures, ranging from 1 to 20 subcategories, and these apply across both defendant and plaintiff cases.

Table 18 – Case Severity Measure**a. Variable Group Rationale****Variable Group Rationale**

- 1 Concerning investments: frauds
- 2 Concerning investments: breaking agreements/duties
- 3 Concerning benefit management/disbursement
- 4 Concerning plan practical operations
- 5 Concerning minor statutory duties regarding operations
- 6 Concerning alterior investment concerns
- 7 Unknown cases

b. Variable Summary and Ranking

<u>Claim Type</u>	<u>Variable Rank</u>	<u>Variable Group</u>	<u>Claim Type Explanation</u>
Secfraud	1	1	Securities fraud (usually under '34 act Rule 10b-5 or section 20(a)) (pension as plaintiff).
Fraud	2	1	An action for fraud (pension as defendant).
breach of fiduciary duty	3	2	The pension fund is alleging breach of fiduciary duty against a company which is one of its investments or against an investment advisor.
breach of k; breach of fiduciary duty	4	2	The pension fund is alleging breach of fiduciary duty and contract against a company which is one of its investments or against an investment advisor.
breach of K	5	2	The pension fund is alleging breach of contract against a company which is one of its investments

or against an investment advisor.

Bankruptcy	6	2	The pension fund is attempting to collect against a company that it's invested in which has gone into bankruptcy.
Antitrust	7	2	The pension fund is attempting to block a merger of a company it is invested in or is a shareholder of a company that another shareholder is attempting to block the merger of.
constitutional challenge	8	3	The plaintiff (beneficiary or other party) is bringing a federal or state constitutional challenge against a law the defendant (pension fund) is trying to follow or enforce.
declaratory judgment	9	3	The plaintiff (beneficiary or other party) is bringing an action to nullify or enforce a federal or state law against a law the defendant (pension).
Proxy	10	2	An action to include a provision in a public company's proxy vote.
Negligence	11	2	A claim that the defendant (pension) did not act as a reasonably careful person would have under the circumstances.
Employment	12	4	An action for discrimination or harrassment.
Recovery	13	3	An action to recover money or property (usually overpayment of benefits).
Denialbene	14	3	Denial of pension fund benefits.
information request	15	5	Request that information be made public or given in response to a subpoena.
Injunction	16	3	Request that an individual (in the legal sense) be foreclosed from some specific action.
condemnation	17	2	The pension fund is invested in real estate which is being condemned.
Tax	18	6	An action to discern whether tax is owed (usually regarding tax-exempt status).

Interpleader	19	3	A request that the court decide who owns money or property. The type of claim is unavailable to the researcher.
[unavailable]	20	7	Not all case detail is available through the legal databases. In some instances only a filing can be discerned, but no details regarding the filing are available.

We have measured both the frequency of the above cases and the severity of each case. **Table 19** shows a summary of descriptive statistics. **Table 20** shows a summary of the variables, their expected and estimated signs, and related p-values using one and two tail tests.

Table 19 – Model II: Descriptive Statistics

Model IIa. – The Legal Index and FEQ in Relation to Pension Plan Funding Ratios

	Case Frequency	Case Severity	Plan as Defendant	Plan as Plaintiff	FEQ	Legal Index
Mean	2.62	23.04	0.76	1.20	19.70	91.19
Median	1.00	4.00	0.00	0.00	15.08	94.88
Maximum	37.00	440.00	33.00	18.00	100.00	100.00
Minimum	0.00	0.00	0.00	0.00	0.00	22.95
Std. Dev.	4.79	60.09	3.34	2.38	17.50	11.66
Skewness	5.08	5.67	8.49	3.96	2.20	-3.18
Kurtosis	33.73	38.20	79.68	24.59	8.31	17.80
Sum	296.00	2604.00	86.00	136.00	2226.58	10304.67
Sum Sq. Dev.	2570.64	404446.80	1250.55	634.32	34318.67	15236.07
Observations	113	113	113	113	113	113

Legal factors are comprised of: Defendant Case Frequency (Plan as Defendant) as measured by number of cases, where the pension was identified as defendant; Total Case Frequency, where the pension was identified as either defendant or plaintiff; Plaintiff Case Frequency (Plan as Plaintiff), where the pension was identified as the plaintiff; Case Severity, where the case was measured based on the qualitative scale shown in Table 17. FEQ is the Fiduciary Effectiveness Quotient in scaled units and the Legal Index is the Legal Index in scaled units.

Model IIb. – Probability Estimate of the Funding Ratio, Cutoff of 0.50

	Market Asset Value	Equities	Fixed Income	Real Estate	Cash and Equivalents	Alternatives	Total Beneficiaries	Annual Contribution Rate	FEQ	Legal Index
Mean	10,966,949	0.52	0.28	0.05	0.03	0.12	40212.69	0.31	19.70	91.19
Median	8,375,970	0.54	0.28	0.05	0.02	0.10	26363.50	0.21	15.08	94.88
Maximum	37,471,268	0.65	0.45	0.16	0.11	0.57	121927.00	7.75	100.00	100.00
Minimum	842,811	0.12	0.13	0.00	0.00	0.00	2391.00	0.06	0.00	22.95
Std. Dev.	8544207	0.10	0.07	0.04	0.03	0.09	31709.95	0.75	17.50	11.66
Skewness	1.307863	-1.67	0.12	0.10	1.26	1.82	0.94	9.65	2.20	-3.18
Kurtosis	3.904759	6.92	2.71	2.37	4.22	8.39	2.75	96.02	8.31	17.80
Sum	1.24E+09	58.47	31.48	5.86	3.12	13.30	4.E+06	31.24	2226.58	10304.67
Sum Sq. Dev.	8.18E+15	1.02	0.49	0.15	0.08	0.99	1.E+11	57.16	34318.67	15236.07
Observations	113	113	113	113	113	113	102	102	113	113

FEQ is the Fiduciary Effectiveness Quotient in scaled units and the Legal Index is the Legal Index in scaled units. Market Asset Value is the value of the pension plan assets in nominal dollar terms. Equities, Fixed Income, Real Estate, Cash and Alternatives are expressed as a percentage of the portfolio allocation. Total Beneficiaries are the total number of beneficiaries covered by each plan. Annual Contribution Rate is the percentage of covered plan compensation. All financial variables are from the Boston College Center For Retirement Research.

Table 20 – Model II: Selected Variables**Legal Variables**

Variable	Description	Expected Signs	Estimated Signs	P Value	Reject / Not Reject
Case Frequency	Total case frequency	+/-	-	0.6073	Reject
Case Severity	Case severity	-	-	0.9905	Reject
Case Frequency – Plan as Defendant	Defendant frequency	-	+	0.9668	Reject
Case Frequency – Plan as Plaintiff	Plaintiff frequency	+	-	0.7820	Reject
Legal Index**	Legal index	+	+	0.0265	Not Reject
FEQ**	Fiduciary Effectiveness Index	+	-	0.0003	Not Reject

Control Variables

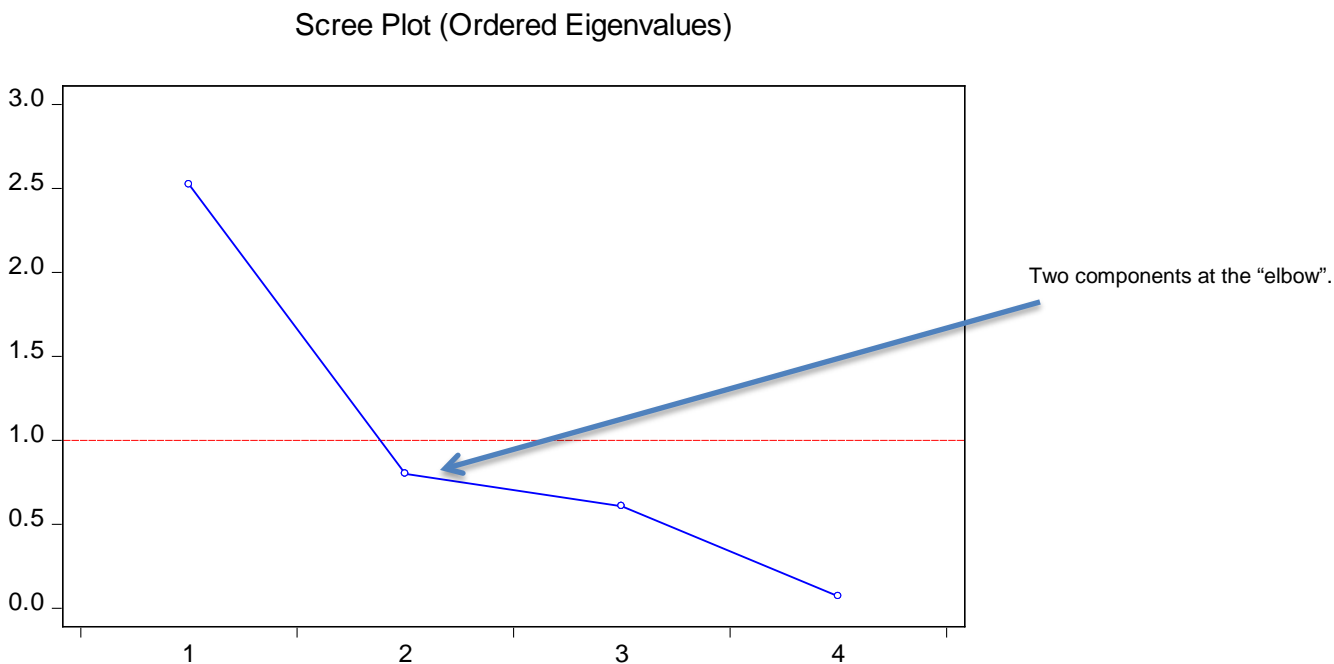
Variable	Description	Expected Signs	Estimated Signs	P Value	Reject / Not Reject
Market Asset Value	Market asset value	+/-	-	0.0000	Not Reject
Equities	Equity investment allocation	+/-	-	0.0033	Not Reject
Fixed Income	Fixed income investment allocation	+/-	-	0.8792	Reject
Real Estate	Real estate investment allocation	+/-	-	0.7211	Reject
Cash	Cash and equivalent investment allocation	+/-	-	0.1332	Reject
Alternatives	Alternatives investment allocation	+/-	-	0.8889	Reject
Investment expenses	Investment expenses and fees	-	+	0.0898	Not Reject
Total Beneficiaries	Total number of beneficiaries	+/-	+	0.0000	Not Reject
Annual Contribution Rate	Required annual contribution rate	+/-	+	0.0029	Not Reject

Reject above the 10% statistical significance level using the t-test. **One tail test. FEQ is the Fiduciary Effectiveness Quotient in scaled units and the Legal Index is the Legal Index in scaled units. Legal factors are comprised of: 1) Defendant Case Frequency as measured by number of cases, where the pension was identified as defendant; 2) Total Case Frequency, where the pension was identified as either defendant or plaintiff; 3) Plaintiff Case Frequency, where the pension was identified as the plaintiff. 4) Case Severity, where the case was measured based on the qualitative scale shown in Table 17. Market Asset Value is the value of the pension plan assets in nominal dollar terms. Equities, Fixed Income, Real Estate, Cash and Alternatives are expressed as a percentage of the portfolio allocation. Investment Expenses are total investment manager fees and expenses in dollars. Total Beneficiaries are the total number of beneficiaries covered by each plan. Annual Contribution Rate is the percentage of covered plan compensation. All financial variables are from the Boston College Center For Retirement Research.

Model II: Absolute Effectiveness – Regression Model (2a-2b)

For the legal factors we also subjected the four legal variables to PCA. This generated 2 factor loadings. We applied the Scree Plot to extract our Eigenvectors. By this we mean, we determined our principal component factor selection by eliminating any factor that appeared to contain less information (i.e. percentage variance) based on the Scree Plot. This generated two factors that captured 83% of the total variance of all 4 variables. Once we had our factor loadings we were able to combine the loadings with each variable, and then apply PCA-determined weights to each new factor. We used a minimum eigenvector of 0.40 to aid in interpreting each component. See **Figure 10** and **Table 21** for the principal component extraction and factor loadings and descriptions.

Figure 10 – Principal Component Extraction Using the Screen Plot, Reduction of Four Legal Factors to Two Principal Components for a Sample of 35 Pension Plans, 2008-2012



Data in table represents 35 plans for the years 2008-2012. Legal factors are comprised of: 1) Defendant Case Frequency as measured by number of cases, where the pension was identified as defendant; 2) Total Case Frequency, where the pension was identified as either defendant or plaintiff; 3) Plaintiff Case Frequency, where the pension was identified as the plaintiff. 4) Case Severity, where the case was measured based on the qualitative scale shown in Table 17.

Table 21 – Legal Index PCA Factor Loadings and Descriptions for a Sample of 35 Public Pension Plans, 2008-2012

Eigenvectors (loadings):		
Variable	Frequency	Severity
Defendant Case Frequency	0.559107	0.105774
Total Case Frequency	0.595327	-0.170935
Plaintiff Case Frequency	0.434593	-0.586978
Case Severity	0.379624	0.784251

Factor loadings descriptions based on a minimum Eigenvector of 0.40. Varimax was the rotation method used. Legal factors are comprised of: 1) Defendant Case Frequency as measured by number of cases, where the pension was identified as defendant; 2) Total Case Frequency, where the pension was identified as either defendant or plaintiff; 3) Plaintiff Case Frequency, where the pension was identified as the plaintiff. 4) Case Severity, where the case was measured based on the qualitative scale shown in Table 17.

The weighted combination of these factors ultimately comprised our index. Each variable was standardized prior to combination. Once the variables were reduced to a single index, we could then normalize the index to reinterpret the index values on a scale of 0-100. It was necessary to reverse the index (subtract each measure from 100) to make consistent with the FEQ measure (i.e., 0 worst, 100 best). This final step allowed the ranking and segmentation of cross-sections into quintile groupings for further analysis and comparison.

Using the same specification and tests for this unbalanced panel regression, we developed the following regression models. Again, the panel was unbalanced because not every observation was available for all plans as described in the earlier section. Legal case data was also uniquely varied in that states report legal cases inconsistently, as well. When considering the most relevant variable for measuring the health of the overall plan, which could be affected by governance issues, financial and legal problems, or all three, it was logical to select the funding ratio as the dependent variable. The first model is an extension of the model in **Table 16 (1c)** that considered the FEQ as the only regressor. Now, taking both the Legal Index and the fiduciary effectiveness index as the regressors, we constructed the following equation:

$$\text{Eq. 5: } \text{FUNDR}(Y)_{\text{citi}} = C + B_1 \text{LI}_{\text{citi}} + B_2 \text{FEQ}(X_1)_{\text{citi}} + \mu$$

Where, FUNDR: Funding Ratio

C: Constant

LI: Legal Index (LegIdx)

FEQ: Fiduciary Effectiveness Index (S_INDEX)

ci: Cross-section (Plan)

ti: Time period (Annual)

μ : Random error term

Table 22 (2a) - The Legal Index and FEQ in Relation to Pension Plan Funding Ratios for a Sample of 35 Plans, 2008-2012

Variable	Coefficient	Std. Error	T-Statistic	P-Value
Constant	0.725	0.049	14.742	0.000
FEQ**	-0.004	0.001	-3.719	0.000
Legal Index**	0.001	0.000	1.965	0.027

R-squared	0.928	Mean dependent var.	0.729
Adj. R-squared	0.893		
F-statistic	27.073	Five periods only	
Prob.(F-Statistic)	0.000	N=113	

**One tail test

Measures are expressed as: Funding ratio, total assets in relation to total projected liabilities (e.g. 0.70 is 70%); FEQ and Legal Index in scaled index units.

While the addition of the Legal Index did not impact the overall fit of the model from the original regression model in **Table 16 (1c)** (i.e., small increase in the adjusted R-Square and slight decrease in the F-Statistic), we do find the estimated coefficient on the Legal Index is statistically significant at below the 3% level, and the FEQ is significant at below the 1% level in **Table 22 (2a)**. The overall model is significant below the 1% level. This combination of factors explains 93% of the variation in the funding ratio (R-squared). The expected and estimated signs for the Legal Index were consistent, and as noted earlier, remain inconsistent for the FEQ. The model results may be interpreted as follows: A one-unit change in the Legal Index is associated with a 0.000971 change in the funding ratio when the FEQ is held constant. It is worth noting when modeling the same relationship without the presence of the FEQ variable, the Legal Index has no significance (p-value is 0.9145).

The next and last model is where we provide the final test of the model in being able to differentiate effectiveness on an absolute basis. Because there were no cases of bankruptcy in the sample, we instead established an absolute ineffectiveness criterion of 50% funded or below for any plan. We selected 0.50 as the threshold for this analysis based on a 2012 brief published by the American Academy of Actuaries on pension plan funding.¹³⁵ In that brief they established a four-point scale for evaluating the strength or weakness of a pension plan. The lowest level in that scale, defined as “weak,” was anything below 0.60. We used that observation as a starting point and then took it down even further for the purpose of this analysis, as we wanted to make sure we were deep into weak or even what may be characterized as “failed” territory. For the funding ratio in our sample this applied to only eight of the 109 observations.

¹³⁵ “The 80% Pension Funding Standard Myth”, Issue Brief, American Academy of Actuaries, July 2012, p. 4. https://www.actuary.org/files/80_Percent_Funding_IB_071912.pdf

We then constructed a binomial dependent variable for a probit model based on the funding ratio. Every variable above 0.50 was assigned a one and anything equal to or below, a zero. The purpose of the model is to estimate the probability that an observation with particular characteristics will fall into one of two categories, in this case a plan deemed effective or ineffective. The value of 0 indicates the plan is underfunded and ineffective, and the value of 1 indicates the plan is effective. This model allows us to examine the related conditions that are causally determining absolute ineffectiveness (i.e., poor governance, underperforming investments, inadequate contributions, etc).

Whereas, the continuous variable of financial performance provides a comparative snapshot of the pension fund from which we can examine a trend that may improve or worsen, the failure mode of the absolute condition gives a measure of failure that is both deeper and more intractable.

The probit model is most often estimated using the standard maximum likelihood procedure. While a probit binary response model is helpful for probability estimation and categorization, the coefficients themselves are not related in a linear fashion with the probabilities. This means coefficient estimates do not give the marginal impact of a change in the attribute on the probability of the dependent variable, and we cannot easily interpret the marginal impact of an independent variable on probability. The marginal impact is not only a function of the coefficient estimates, but of the value or size of independent variable as well. One final note, we used White's method for heteroscedasticity correction just as with the prior models.

With this as background, here is the last and final regression equation using the probit method for the model testing absolute effectiveness (using the original selected variables from 1(a)):¹³⁶

$$\text{Eq. 6: } \Pr(\text{FUNDR}(1,0)_{\text{citi}}) = C + B_1\text{FEQ}(X_1)_{\text{citi}} + B_2\text{LI}(X_2)_{\text{citi}} + B_3\text{MVA}(X_3)_{\text{citi}} + B_4\text{Eq}(X_4)_{\text{citi}} + B_5\text{Fx}(X_5)_{\text{citi}} + B_6\text{Re}(X_6)_{\text{citi}} + B_7\text{A}(X_7)_{\text{citi}} + B_8\text{CCE}(X_8)_{\text{citi}} + \mu$$

Where, $P(\text{FUNDR}(1,0))$: Probability of the funding ratio being above or below 0.50

C: Constant

FEQ: Fiduciary Effectiveness Index (FEQ) (S_INDEX)

LI: Legal Index (S_LEGIDX)

MVA: Market Asset Value (MKTASS)

Eq: Equity allocation (EQUITIES_TOTSA)

Fx: Fixed income allocation (FIXEDINCOME_TOTSA)

Re: Real estate allocation (REALESTATESA)

A: Alternative investment allocation (ALTERNATIVESSA)

CCE: Cash and cash equivalent allocation (CASHANDSHORTTERMSA)

BN: Total beneficiaries (BENEFICIARIES_TOTSA)

RC: Required contribution rate (REQCONTRATE_TOTSA)

ci: Cross-section (Plan)

ti: Time period (Annual)

μ : Random error term

¹³⁶ All original variables were used from Model 1(a) except for investment expense, which affected a "complete separation" of the model in the estimated parameters due to incompatibility of this variable within the probit model.

Table 23 (2b.) - Probability Estimate of the Funding Ratio, Cutoff of 0.50, for a Sample of 31 Plans, 2008-2012

Variable	Coefficient	Std. Error	Z-Statistic	P-Value
Constant	6.810	3.342	2.038	0.042
FEQ	0.065	0.030	2.172	0.030
Legal Index	-0.042	0.034	-1.239	0.215
Market Asset Value	-9.19E-08	4.34E-08	-2.116	0.034
Equities	-3.263	2.570	-1.270	0.204
Fixed Income	-1.147	1.727	-0.664	0.507
Real Estate	-2.575	1.344	-1.916	0.055
Alternatives	-2.853	2.458	-1.161	0.246
Cash and Equivalents	-1.520	0.811	-1.874	0.061
Total Beneficiaries	0.406	1.326	0.306	0.759
Required Contribution Rate	-0.146	0.071	-2.040	0.041

McFadden R-squared 0.519 Mean dependent var. 0.927
 LR-statistic 29.688
 Prob.(LR-statistic) 0.001 Five periods only

Observations with Y=0 8 N=109
 Observations with Y=1 101

Measures are expressed as: Probability (Funding Ratio above or below 0.50) is the dependent variable; FEQ and Legal Index in scaled index units. The rest are in standardized form: Market Asset Value in thousands of U.S. dollars; Equities, Fixed Income, Real Estate, Alternatives and Cash and Equivalents as a percent of the total investment allocation; Total Beneficiaries in number of people; and Required Contribution Rate as a percentage of covered plan compensation.

In **Table 23 (2b)** the estimated coefficient on the FEQ is significant below the 1% level. Market Asset Value, Allocation to Real Estate and Allocation to Cash also have statistically significant coefficient estimates at the 5% level or below. While the Legal Index was itself not statistically significant, it did improve the overall fit of the model by increasing both the pseudo-R squared and reducing the Likelihood Ratio statistic. The overall model is statistically significant below the 1% level based on the probability of the Likelihood Ratio test statistic. The McFadden pseudo R-squared is modestly high at 0.51. A good probit model will have pseudo R-squared measures in the 0.20-0.40 range.¹³⁷ To help us with interpretation of these results, **Table 24 (2b.)** provides an Expectation-Prediction Evaluation for Binary Specification using 0.5 as the cutoff. The model demonstrates a 93% success rate in correctly estimating the binomial measure of effectiveness. It is worth noting, however, that the model was much more effective in capturing effective plans (96%), and less so in distinguishing ineffective plans (51%). This may be because there were such a relatively small number of observations that fell into the “failed” category (only 8 of 109 observations or 7.3% of all cases) during the five year time period.

Table 24 (2b.)- Expectation-Prediction Evaluation for Binary Specification

	Estimated Equation			Constant Probability		
	Y=0	Y=1	Total	Y=0	Y=1	Total
E(# of Y=0)	4.10	4.09	8.18	0.59	7.41	8.00
E(# of Y=1)	3.90	96.91	100.82	7.41	93.59	101.00
Total	8.00	101.00	109.00	8.00	101.00	109.00
Correct	4.10	96.91	101.01	0.59	93.59	94.17
% Correct	51.22	95.95	92.67	7.34	92.66	86.40
% Incorrect	48.78	4.05	7.33	92.66	7.34	13.60
Total Gain*	43.88	3.29	6.27			
Percent Gain**	47.35	44.87	46.11			

*Change in "% Correct" from default (constant probability) specification

**Percent of incorrect (default) prediction corrected by equation

¹³⁷ <http://stats.stackexchange.com/questions/82105/mcfaddens-pseudo-r2-interpretation/99615>

Finally, **Appendix C** provides a quintile breakdown of the legal factors, factor by factor, which generated many of the key findings discussed in the next and final chapter.

The fiduciary effectiveness of boards and committees charged with managing investment pools can be measured both on a relative and absolute basis as demonstrated by our review of the U.S. Public Pension Plan system. Our examination of the minutes data of 35 public pension plans generated sufficient information over a five-year period to ascertain 17 governance factors. When subjected to Principle Components Analysis, a data reduction technique, we produced a standardized index measure, the Fiduciary Effectiveness Quotient (FEQ). When combined with other financial and demographic variables, we were able to construct a model that explained a large percentage of the variation in investment return performance. As a standalone measure, the explanatory power of the index was even greater when applied to municipal bond yields and the funding ratio. We did, however, uncover some sign inconsistency in the latter two measures that raised some questions.

Turning to a measure of absolute effectiveness, our collection of legal case data over the study period for 153 plans yielded two variables of interest: case severity and case frequency. We collected data on 153 plans, and not 163, because not every state is consistent in making this type of legal data readily available. This was further reduced to the Case severity is based on a qualitative assessment of each case type across 20 categories. Case frequency is simply a measure of how often the cases occur for each plan. We found evidence of a statistical relationship between the funding ratio when regressing it against the Legal Index and the fiduciary effectiveness measure. When applying a probit model, we were able to identify with 93% accuracy based on a similar grouping of independent variables found in our first model including both the FEQ and Legal Index,

whether a plan was likely to be deemed effective or ineffective based on a minimum funding ratio criterion of 0.50.

The one relationship we anticipated finding was that the FEQ would be a determinant of the Legal Index, and this was not to be the case. One possible explanation is that the legal aspects during this period are less directly related to governance, and more related to the period in time – during and after the GFC – where there was a burst of security litigation, which produced a certain amount of atypical noise in the data distorting or at least making the relationship less clear. **Table 25** shows the increase and subsequent decline in class action litigation during the study period as a percentage of overall cases. Interesting to note the sudden spike in the 2013 filings by private citizens against public plans. This may become clearer with expansion of the time period under analysis, especially as the pension crisis has grown in certain geographies following the study period.

Table 25 – Percentage Share of Cases Filed by Year, 2008-2013

Year	Class Action Filed by Plan Against Investment	Private Citizen Filed Against Plan
2008	31.91%	42.43%
2009	24.63%	48.37%
2010	26.38%	41.45%
2011	12.36%	41.95%
2012	23.00%	36.67%
2013	21.32%	66.91%

CHAPTER VI
RESULTS, CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

This study asks a very simple question, “how do I know that my money is being managed effectively by an organization whose members I do not know and over whom I have little or no control.” Unlike a company which is subject to the change of control market, where a buyer (or a creditor) will come in and take over a poorly run company, a poorly run pension plan has no such corrective mechanism other than bankruptcy, or municipal bond market pressure as noted throughout this study.

Governance in investment management is a topic that has received much interest as of last few years, and has many voices. However, most opinion is based on “expert opinion” or survey data, which is subject to the self-reporting bias of the organizations being surveyed. The goal in this study was to find out what actually matters based on empirical measures, without the interference and noise of opinion, self-reported or otherwise. To do this we turned to the tools of corporate governance, a huge body of work that spans the last 30 years, and applied these methods to our examination of investment organizations to come up with comparable and comprehensible measures that carry statistical validity in their assessments. We sought to understand what makes for differences in organizations, their relative effectiveness, and what makes them effective on an absolute basis.

To do this we gathered data on U.S. Public Pension Plans. Their public policy import in their role in providing retirement security to millions of Americans notwithstanding, they produce data, which permitted depth to this investigation. We gathered data on 35 pension plans representing nearly 15% of U.S. public pension system by assets for this study. We

came up with results that are compelling not only in terms of demonstrating the critical role of governance in asset ownership, but produced findings that may ultimately prove useful to strengthening our systems of pension, foundation, endowment and trust management.

Purpose

The purpose of the research was to identify and measure the key factors that drive fiduciary effectiveness. With the data we collected on the factors we identified, our models demonstrated explanatory power on whether an organization is at risk of a significant fiduciary breach defined as a bankruptcy, litigation case, reorganization, regulatory violation, crime or other fiduciary problem. Additionally, our composite rating of fiduciary effectiveness allowed the construction of an index of relative measures, making organizations comparable side-by-side. This composite rating system, a measure of overall effectiveness, is the *fiduciary effectiveness quotient* or *FEQ*.

Research Questions

The key goals for the research were:

- To understand the relationship of an organization's FEQ and the long-term investment returns (and other financial measures such as funding ratio and bond interest cost or yield spread) of the organization's respective investment pool to link organizational structure and behavior with performance outcomes.

- To assess the model in identifying and correctly categorizing plan fiduciary problems. This was shown through a binary response (Probit) model to assess the accuracy of the model in correctly predicting (categorizing) plans as effective or ineffective.

These were the research questions:

1. What are the attributes of an effective fiduciary, and what particular attributes drive effectiveness, and are these attributes measurable?
2. If so, can an organization be usefully rated on a composite, index basis for effectiveness using these measures?
4. Can these measures be explanatory of conditional outcomes and directly linked to improved investment performance and a better funding status?

To help answer these questions, we tested two hypotheses:

Hypothesis I – Relative Effectiveness: The Effectiveness to Performance Link

H₀: An organization's FEQ has no relationship to the organization's investment return over a market cycle (typically defined as a three to five year period).

H₁: An organization's FEQ demonstrates a clear, positive relationship to the organization's investment return over a market cycle (typically defined as a three to five year period).

Hypothesis II – Absolute Effectiveness: The Probability of Being an Effective Organization

H₀: An organization's FEQ has no explanatory power over whether an organization may be designated Fiduciary Effective (absent the following conditions: significant underfunding, bankruptcy, litigation, reorganization, regulatory violation, crime or other fiduciary problem).

H₁: An organization's FEQ is explanatory.

Review of the Methodology

Population and Sample For the study period, there were approximately 6,300 public retirement systems in the United States with over \$3 trillion in assets. Our study sample is comprised of 163 of the largest state and municipal pension systems from this population representing assets of over \$1.4 trillion. It is based on the Public Plans Database provided by the Center for Retirement Research at Boston College and other data availability as discussed below.

Data Collection and Procedures Over two years we employed research assistants in both the Marquette law school and in the business school finance department to gather data for each separate database. For the Governance database, our research assistants collected the meeting minutes for every organization available online over the five year study period. The availability of meeting minutes reduced our sample to 35 plans and 113 observations for this study. A sample of bond yield data consisted of 10 plans and 27 observations. For the legal database, the research assistants collected data from multiple legal database sources, using Bloomberg, Westlaw and Lexis Legal, to collect observations for each pension plan in the sample over the five-year period. While we were able to collect data on 153 plans, we were only able to make use of the data for the 35 plans in our sample.

Index Construction We then constructed the FEQ and Legal Indexes, and confirmed the statistical robustness of the measure. Standardizing the indexes allowed us to measure public pension plan governance and legal/regulatory characteristics on a scale of 1-100. We were then able to rank order the plans and organize them into quintile groups. This then allowed us to go back to each of the 17 governance and 4 legal factors and review each for major differences between top and bottom quintile groupings.

A quintile is a statistical value of a data set that represents 20% of a given population, so the fifth quintile represents the lowest fifth of the data (1-20%); the fourth quintile represents the second fifth (21% - 40%) and so on. Quintiles are often used to create cut-off points for a given population. This allows the characteristics of each quintile to be compared to understand where factors may stand out as distinctive to each population sub-group, which is exactly what we did in this case. Once we rank ordered the panel by FEQ, and separately for the Legal Index, we could then examine each quintile to understand the characteristics of each governance factor for the respective quintile group including similarities and differences across each sub-group. Appendixes B and C provide the graphical quintile analysis for each governance and legal factor.

Major Findings

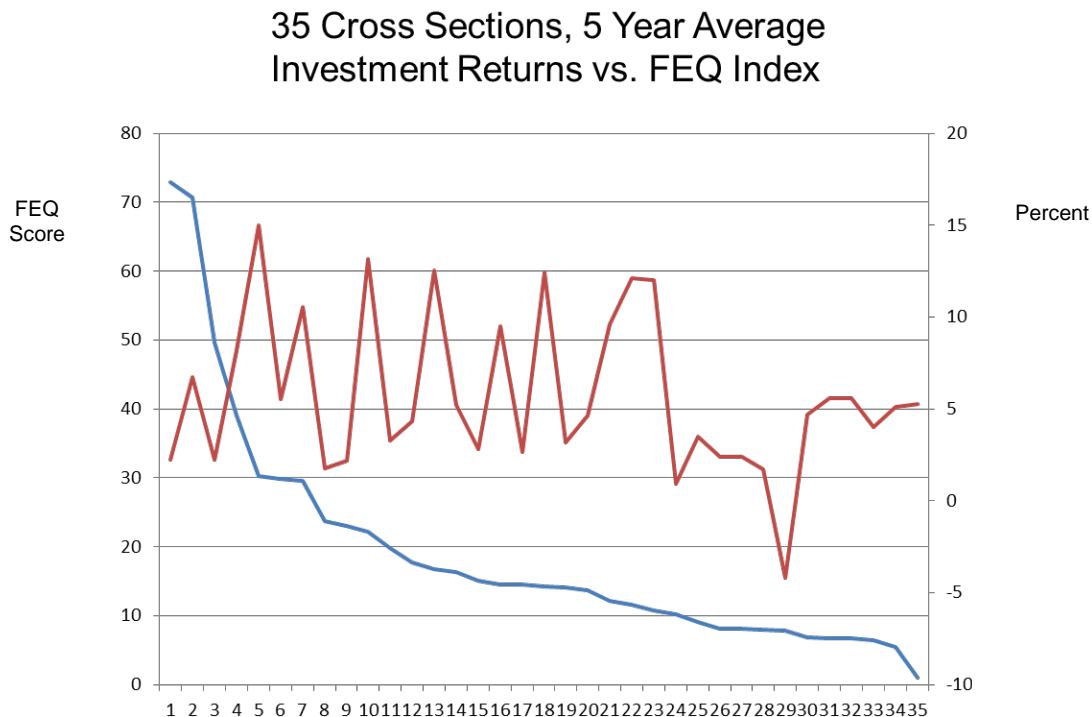
There were several major findings in this research summarized first in graphical form and with further explanation below. **Figure 11** shows comparison of the FEQ index and five-year average investment returns by plan. **Figure 12** compares the FEQ index, five-year average investment returns and interest cost (as measured by bond yield spreads) by quintile. **Figure 13** shows a comparison of the Legal Index and five-year average funding

ratio, and **Figure 14** compares the Legal Index, five-year average funding ratio and interest cost (as measured by bond yield spreads) by quintile. Major findings include:

1. Top quintile FEQ organizations outperform bottom quintile FEQ organizations nearly 2 to 1. Average investment returns over a five-year period were 7.22% for the top quintile versus 3.74%, for the bottom quintile. Compounded over years this difference could mean billions of dollars in forgone contributions to pension plans across our nation's pension system.
2. Higher FEQ organizations have lower interest cost on their municipal bonds than lower FEQ organization (27% less, comparing second and fourth quintile. Data for the fifth quintile was not available).
3. Higher Legal Index scoring organizations have lower interest cost on their municipal bonds than lower scoring organization (over 50% less, comparing first and fifth quintile).
4. The FEQ and the Legal Index have a direct impact on the funding ratio of pension plans (explain 89% of the variation in the funding ratio), an important measure of pension plan financial health.
5. The FEQ, Legal Index and other factors were 93% accurate in distinguishing effective from ineffective plans as defined as plans having a funding ratio above or below 0.50.
6. There was no statistical evidence of a relationship between investment expenses and investment performance in the FEQ model. It was one of only two regressors in the model not to have any statistical significance.¹³⁸ The implication is that other factors are more important (i.e., fiduciary effectiveness, asset allocation, total assets under governance, etc.).

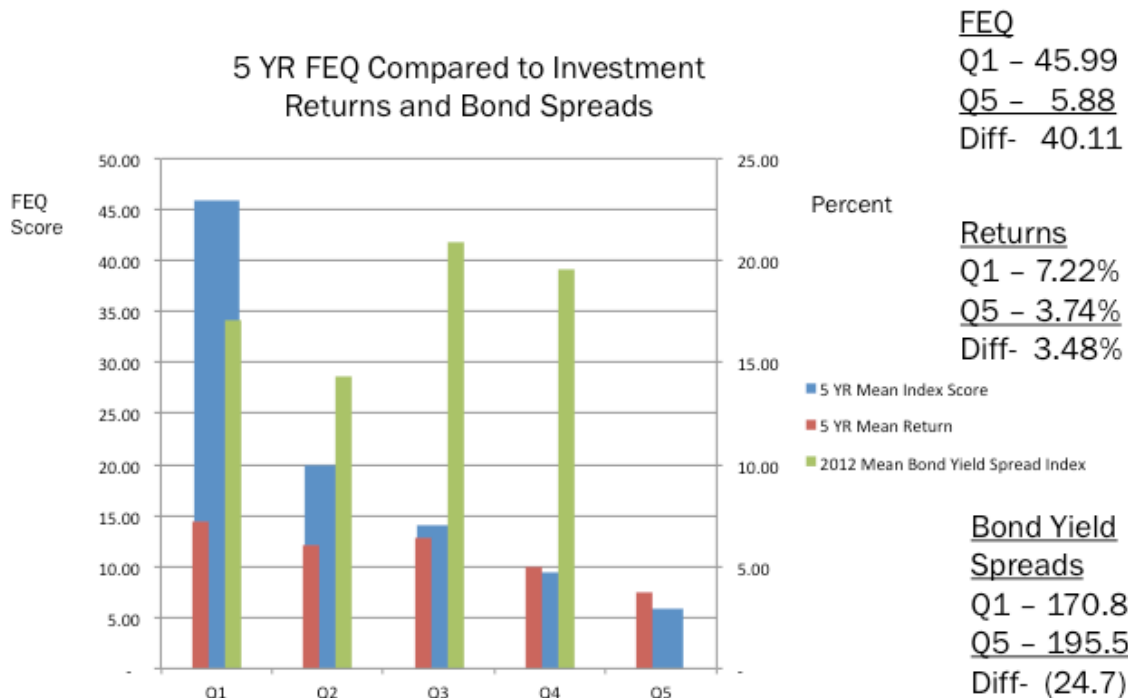
¹³⁸ The other was Required Contribution Rate.

Figure 11 – FEQ Index Compared to Investment Returns for a Sample of 35 Plans



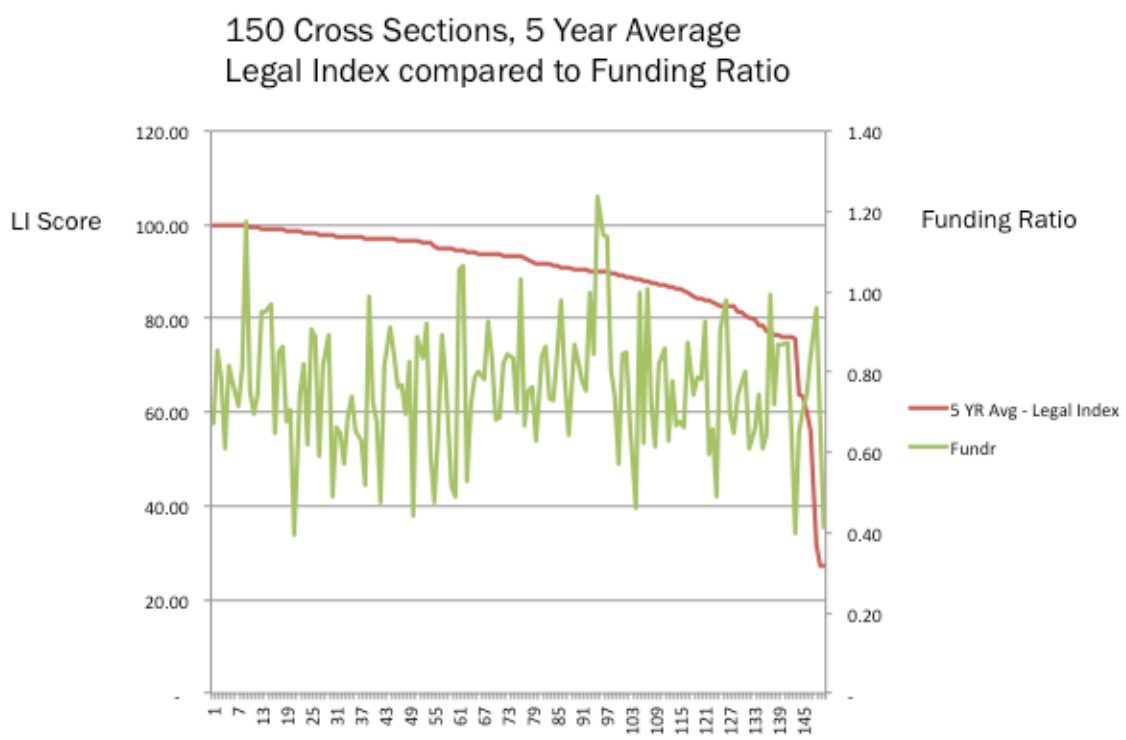
The FEQ or Fiduciary Effectiveness Quotient is measured in scaled units. Investment returns are one year returns shown averaged over five years in percent. The FEQ is based on seventeen governance factors including 1) Meeting Length is duration in hours; 2) Page length is the number of minutes pages; 3) Appointee Composition is the percentage of appointees on the board; 4) Audit Committee is the percentage of board members on the committee; 5) Employee Composition is the percentage of employees on the board; 6) Investment Committee is the percentage of board members on the committee; 7) Staff Composition is the percentage of staff attending the meeting; 8) Board Attendance is the percentage of board members attending the meeting; 9) Retiree Composition is the percentage of retirees on the board; 10) Board Chair Turnover is expressed as the percentage of board size, e.g., if the board chair turned over every year and the board were ten people, the percentage would be 10%, every two years 5%, etc; 11) Treasury Composition is the percentage of the board represented by the treasurer and staff; 12) Board Turnover is also expressed as a percentage of board size; 13) Board Size is the number of board members; 14) Investment Discussion is the number of key words counted in each meeting minutes; 15) Meeting Frequency is the number of board meetings per year; 16) Consultant Attendance is the percentage of meeting attendance by the consultant; 17) Consultant Turnover is expressed as a ratio of number of consultants per year. Source: Public pension plan meeting minutes available on plan web sites.

Figure 12 – FEQ Index Compared to Investment Returns and Municipal Bond Spreads by Quintile for a Sample of 35 Plans



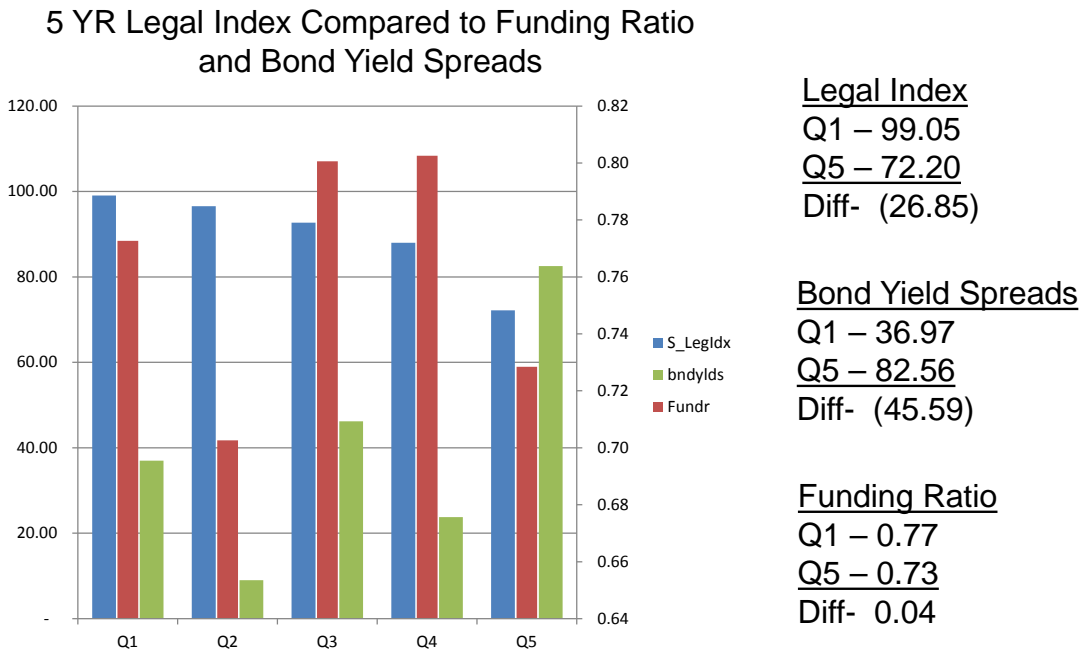
The FEQ or Fiduciary Effectiveness Quotient is measured in scaled units. Investment returns are one year returns shown averaged over five years in percent. Bond yield spreads measure the difference in municipal bond yields for a given municipality or state against a broader municipal bond index and are in basis points (1% = 100 bps). The FEQ is based on seventeen governance factors including 1) Meeting Length is duration in hours; 2) Page length is the number of minutes pages; 3) Appointee Composition is the percentage of appointees on the board; 4) Audit Committee is the percentage of board members on the committee; 5) Employee Composition is the percentage of employees on the board; 6) Investment Committee is the percentage of board members on the committee; 7) Staff Composition is the percentage of staff attending the meeting; 8) Board Attendance is the percentage of board members attending the meeting; 9) Retiree Composition is the percentage of retirees on the board; 10) Board Chair Turnover is expressed as the percentage of board size, e.g., if the board chair turned over every year and the board were ten people, the percentage would be 10%, every two years 5%, etc; 11) Treasury Composition is the percentage of the board represented by the treasurer and staff; 12) Board Turnover is also expressed as a percentage of board size; 13) Board Size is the number of board members; 14) Investment Discussion is the number of key words counted in each meeting minutes; 15) Meeting Frequency is the number of board meetings per year; 16) Consultant Attendance is the percentage of meeting attendance by the consultant; 17) Consultant Turnover is expressed as a ratio of number of consultants per year. Source: Public pension plan meeting minutes available on plan web sites.

Figure 13 – Legal Index Compared to Plan Funding Ratios, 5 YR Average, 2008-2012



Five years average of Legal Index shown for 150 pension plans compared to the five-year average funding ratio. The Legal Index is shown in scaled units. The funding ratio is a ratio of the market value of the assets to projected benefit obligations. The Legal Index is comprised of: 1) Defendant Case Frequency as measured by number of cases, where the pension was identified as defendant; 2) Total Case Frequency, where the pension was identified as either defendant or plaintiff; 3) Plaintiff Case Frequency, where the pension was identified as the plaintiff. 4) Case Severity, where the case was measured based on the qualitative scale shown in Table 18.

Figure 14 – Legal Index Compared to Plan Funding Ratios and Bond Yield Spreads, 5 YR Average, By Quintile, 2008-2012



Five year average of the Legal Index shown for 31 pension plans compared to the five-year average funding ratio and 2012 bond yield spreads, broken down by quintile group. The Legal Index is shown in scaled units. The funding ratio is a ratio of the market value of the assets to projected benefit obligations. Bond yield spreads are shown in basis points (1%=100 bps). The Legal Index is comprised of: 1) Defendant Case Frequency as measured by number of cases, where the pension was identified as defendant; 2) Total Case Frequency, where the pension was identified as either defendant or plaintiff; 3) Plaintiff Case Frequency, where the pension was identified as the plaintiff. 4) Case Severity, where the case was measured based on the qualitative scale shown in Table 18.

Key Findings

Governance Factors

Table 26 summarizes the key findings. Boards of top quintile plans when compared to bottom quintile plans display the following governance characteristics:

- Have a higher FEQ Score (87% higher)
- Meet more often (42% more)
- Meet longer (23% longer)
- Turnover their membership less frequently (31% less)
- Have more substantive discussions (75% higher)
- Have fewer board members (26% fewer)
- Have greater attendance (8% more)
- Have higher participation on investment and audit committees (61% and 78%, respectively)
- Have their consultant present (51% more)
- Turnover their board leadership less (26% less)
- Have more staff participation in meetings (36% more)
- Have more appointed than elected members (71% more)
- Tend to be larger plans (9% larger)
- Have 48% higher returns long-term
- Have 27% less interest cost on related municipal bonds

Table 26: FEQ Key Findings – Top Quintile versus Bottom Quintile, 5YR Average, 2008-2012

	Top Quartile	Bottom Quartile	Difference	% Difference
FEQ Score*	45.99	5.88	40.11	87.2%
Investment returns*	7.22	3.74	3.47	48.1%
Funding ratio	0.74	0.79	-0.04	-5.9%
Market asset value	12,871,838	11,658,134	1,213,704	9.4%
Bond yield spreads (a)	129.83	167.01	-37.2	-28.6%
Consultant turnover	0.26	0.03	0.23	88.9%
Meeting frequency	12.13	7.02	5.11	42.1%
Board turnover	20.60	27.07	-6.46	-31.4%
Investment discussion	63.61	16.10	47.51	74.7%
Page length	21.93	4.46	17.46	79.6%
Meeting length*	3.17	2.46	0.72	22.6%
Board size*	9.54	11.98	-2.44	-25.6%
Board attendance*	83.22	76.20	7.03	8.4%
Retiree composition (a)	6.83	1.72	5.11	74.9%
Employee composition*	15.25	1.43	13.81	90.6%
Appointee composition	16.83	4.85	11.98	71.2%
Board members on investment committee	58.29	22.48	35.80	61.4%
Board members on audit committee*	37.01	8.05	28.96	78.2%
Staff composition*	9.89	6.35	3.54	35.8%
Treasury composition*	1.90	5.42	-3.52	-184.7%
Consultant attendance* (a)	0.72	0.35	0.37	51.1%
Board chair turnover	3.86	4.88	0.15	-26.6%

*Statistically significant at minimum 10% level

(a) Compares first or second and third or fourth quintiles due to outliers, unavailable data
Investment Return is the 1-year return. Bond Yield Spread is the difference in the index yield of the given plan's municipality's general obligation bonds and the referenced broad index yield for similar duration general obligation municipal bonds. Funding Ratio is the ratio of plan assets to projected liabilities. FEQ is the Fiduciary Effectiveness Quotient, an index variable composed of 17 governance variables. Meeting Length is duration in hours. Page length is the number of minutes pages. Appointee Composition is the percentage of appointees on the board. Audit Committee is the percentage of board members on the committee. Employee Composition is the percentage of employees on the board. Investment Committee is the percentage of board members on the committee. Staff Composition is the percentage of staff attending the meeting. Board Attendance is the percentage of board members attending the meeting. Retiree Composition is the percentage of retirees on the board. Board Chair Turnover is expressed as the percentage of board size, e.g., if the board chair turned over every year and the board were ten people, the percentage would be 10%, every two years 5%, etc. Treasury Composition is the percentage of the board represented by the treasurer and staff. Board Turnover is also expressed as a percentage of board size. Board Size is the number of board members. Investment Discussion is the number of key words counted in each meeting minutes. Meeting Frequency is the number of board meetings per year. Consultant Attendance is the percentage of meeting attendance by the consultant. Consultant Turnover is expressed as a ratio of number of consultants per year. Source: Public pension plan meeting minutes available on plan web sites.

The finding related to investment expenses was interesting to note. We found no statistical significance in relation to investment returns in the first regression model (Model 1(a)) that looked at investment returns in relation to the FEQ and other variables for 35 plans in our sample set. As noted in the last chapter regarding investment expenses, this finding is of interest because it calls into question the current emphasis in the industry on reducing investment expenses. In actuality, an over-emphasis on reducing investment expenses may actually harm pension plan performance. I refer the reader to a recent *Wall Street Journal* article on the very low cost approach Nevada's pension system has taken for a view into this low-cost obsession, as was the main theme in this story. Nevada is definitely an extreme example in that to save money the system employs a single person to manage a collection of passive or indexed investments. Compare that to CalPERS, the largest public pension fund in the country, which employs nearly 3,000 people.¹³⁹ As it turns out, Nevada fell into our data sample, and did not score particularly well on the FEQ, and has average to below average returns, and average to below average funding ratios, which places Nevada at the median among all state pension systems.¹⁴⁰

What about Nevada lead it not to score particularly well in its FEQ measure? Its average five-year FEQ score was 14.6, which is below the average of 19.7. It had relatively higher turnover of leadership; average levels of board turnover; no board members serving on audit; no staff attendance in meetings (for the obvious reason that other than the chief investment officer, there are no staff members); low levels of diversity among board representatives; and a lower "investment discussion" measure. This despite areas of strength including smaller board size, and relatively high attendance of board members and the consultant.

¹³⁹ <https://www.calpers.ca.gov/docs/forms-publications/facts-at-a-glance.pdf>

¹⁴⁰ Martin, Timothy W. "What Does Nevada's \$35 Billion Fund Manager Do All Day? Nothing Nevada goes passive to beat peers; BLT or tuna", *Wall Street Journal*, October 19, 2016

Legal Factors

Table 27 summarizes the key findings. Top quintile plans when compared to bottom quintile plans display the following legal characteristics:

- Have a higher Legal Index score (27% higher)
- Have much fewer legal cases (5x less), and fewer frivolous cases (20x less).
- Are named defendants less (96x less)
- Are pursuing litigation less as plaintiffs (42x less)
- Are 5.7% better funded
- Have less than half of the bond interest cost on related municipal bonds.

Table 27: Legal Index Key Findings – Top Quintile versus Bottom Quintile, 5 YR Average, 2008-2012

	Top Quintile	Bottom Quintile	Difference	% Difference
Legal Index*	99.05	72.20	26.85	27.1%
Funding ratio	0.77	0.73	0.04	5.7%
Investment return	2.83	3.09	(0.26)	-9.2%
Bond yield spread	36.97	82.56	(46)	-123.3%
FEQ*	3.56	4.94	(1.38)	-38.8%
Case frequency	1.00	5.00	(4.00)	-400.0%
Case severity	0.52	10.76	(10.25)	-1978.8%
Case freq. – plan as defendant	0.07	6.75	(6.69)	-10030.0%
Case freq. – plan as plaintiff	0.05	2.10	(2.05)	-3837.5%

*Statistically significant at minimum 10% level

Five year average of the Legal Index shown for 31 pension plans compared to the five-year average funding ratio and 2012 bond yield spreads, broken down by quintile group. The Legal Index is shown in scaled units. The funding ratio is a ratio of the market value of the assets to projected benefit obligations. Bond yield spreads are shown in basis points (1%=100 bps). The Legal Index is comprised of: 1) Defendant Case Frequency as measured by number of cases, where the pension was identified as defendant; 2) Total Case Frequency, where the pension was identified as either defendant or plaintiff; 3) Plaintiff Case Frequency, where the pension was identified as the plaintiff. 4) Case Severity, where the case was measured based on the qualitative scale shown in Table 18.

Findings Related to the Literature

A recent report by J.P. Morgan Fixed Income on pension risk in municipal bonds represents the growing awareness – yet misguided emphasis on fiscal matters only – of this risk to municipal bond investors.¹⁴¹ The authors of the report produced a regression model using budgetary factors in relation to bond yield spreads, and concluded underfunded pensions had a relationship to higher bond interest costs, which is consistent with the conclusions of this study. However, the budgetary factors selected for the model appeared from the scatter plots in the report to be driven by outliers and showed nominally very little relationship. In this case the extremes of Chicago and Pennsylvania appeared to strongly bias the results. The gaps in the report underscored the need for additional factors and analysis.

What is interesting is that in that report they estimated that poor pension funding on average would drive bond yield spreads up 39 bps, and in our study we found consistent results: the difference between first and fifth quintile plan bond yield spreads were 25 bps (by FEQ) and 46 bps (by Legal Index), respectively, during the study period.

As we noted earlier, most studies have focused on investment managers, such as the Morningstar and FI360 rating systems, and others have looked at one or two aspects of the fiduciary issue. To date, no study has comprehensively examined fiduciary effectiveness of primary institutional fund organizations as a whole, nor applied it so that it can be used in comparing multiple organizations. Certainly, none have focused on an overall fiduciary effectiveness score for the governing fiduciary.

¹⁴¹ DeGroot, Peter, Narayan, Karthik, and Henriques, Drew, "U.S. Fixed Income Markets Weekly: US Pension Plan Update: Underfunded plans to have a higher spread beta to an economic downturn necessitating increased due diligence", J.P. Morgan, June 10, 2016, pp. 11-15

Matkin et al (2016) call for a more comprehensive, data-driven approach to understanding public pension finance. This call to action demands two things: 1) more complete datasets are needed to analyze this complex topic; and 2) better ways of analyzing the data to improve both public policy and private sector activity.

The corporate governance methods of analysis and data collection methods of organizational behavior addressed in this paper may hold the keys to answering this call. With this empirical review now completed across a foundational and influential set of asset owners in the U.S., we have the basis for evaluating these organizations and additionally creating new survey methods that may help organizations undertake meaningful self-assessments. Most importantly, we can through these methods equip investors, beneficiaries, donor and taxpayers with the tools to understand, assess and compare these organizations.

Recommended Best Practices

Finally, and in summary, several things stand out from the data regarding top FEQ organizations. Here is what the data tell us regarding best practices:

1. **Top FEQ organizations document and disclose their activities more comprehensively, and hit on more key points.** Average meeting minutes are 21 pages in length. Key word measures on average for top organizations were 63 words per meeting, which were several times the sample average.
2. **Top FEQ organizations meet longer, more frequently and have higher attendance rates, both from board members and the consultant:** On average duration of meetings is around three hours and boards meet monthly. On average board attendance is 83%, and in five out of seven cases

nearly 90% or better. In the case of the consultant, on average better than 70%, but in five out of seven cases, greater than 90%.

3. **Top FEQ organizations have consistently lower board turnover, lower leadership turnover and lower consultant turnover:** On average the boards' turnover is no more frequent than every five years, and in three out of seven cases, there was no turnover during the study period. Average turnover of the consultant was no more than once every four years, and average turnover of the board chair was no more than once every two years. Again here, in three out of seven cases there was no turnover of the board chair.
4. **Top FEQ organizations have smaller boards.** On average boards tend to be smaller. The average of the top quintile was nine, but four out of seven had less than 9 members.
5. **Top FEQ organizations have much greater participation on the investment and audit committees:** On average nearly 60% of the board serves on the investment committee, and nearly 40% on audit. Again, these were both markedly higher than the overall sample.
6. **Top FEQ organizations have more diverse boards, and consistently greater attendance by professional staff:** Top organizations see higher percentage composition and participation of appointees, retirees and staff, and lower percentage representation of the treasury department. Interesting to note that plans that outperform tend to have more appointed than elected members.

Conclusions

This is a critical period of transition for our world. The next century will likely be very different from the last. Transitioning from an industrial-based society to a society based on informatics and computer processing, so-called Big Data, while maintaining our standard of living, promoting our non-profit and cultural institutions and ensuring the retirement security of our aging citizens will remain a challenge for the foreseeable future. This comes at a time when global finance is under heightened scrutiny and income yield is at a low point, which means greater urgency for finding new ways of maintaining oversight and control of institutions that significantly influence general social welfare.

Addressing our global retirement savings crisis requires a fresh approach. Contending with the existing state capitalist welfare system of public and private pensions in a world of lower potential future returns demands better and more accountable forms of governance for organizations to become more efficient and effective. Maintaining better oversight and control of our endowed and foundational institutions is also increasingly crucial in a world competing for limited resources and donor support.

Endeavoring to understand governance-linked performance outcomes requires the “heavy lifting” of gathering new forms of data for analysis. Supposition and assumptions heretofore have been the main approach to this topic. We aim to change that with the new empirical approach of this research.

Implications

What I proposed through this study is a shift in paradigm in the way we, as a society, think about and address the role of the governance fiduciary, which has significant public policy implications. If such a scoring system or index becomes accessible to the general public, organizations would have an incentive to adopt and promulgate a positive rating through investor, donor or beneficiary communications such as annual reports; and avoid a negative rating, such as in the media, to attract future contributions from donors and investors in a highly competitive marketplace. Donors and investors would have an incentive to know in advance of making a contribution to an organization, how effectively that contribution will be managed. Taxpayers would equally benefit from a system of accountability for funds being managed by the public sector. Organizations that engage in meaningful self-assessment could benefit.

The statistical robustness of the research, properly implemented, could lead to the creation of a system that would “raise all boats” through providing institutions, their donors and investors, the tools by which they can measure, improve and communicate the effectiveness of their own organizational management.

Recommendations for Future Research

More data over time is needed. The changes in our political economy that have taken place, especially in the last two years, are significant. Pension and fiscal crises in Chicago, Stockton, and Puerto Rico and other places all occurred after the study period. Municipal bond yield spreads have exploded since Chicago was downgraded by Moody's in

May 2015. GASB changes in 2015 along with how ratings agencies like Moody's report have also occurred, creating more transparency in the market. This is a sea change in our country. I believe the strong relationship of the factors identified within the study during the study period, would only appear even more dramatic in light of the events of the growing crisis following since the study period ended.

Additional work on variables that fell outside the scope of this study - or were simply not available - is also recommended. Compensation as a factor alone could be fodder for another dissertation. What the impacts from differences in compensation in the public pension and asset owner world are little understood. Some industry observers believe that one of the reasons the Canadian pension system is so professional and well-managed is that its people are very well compensated.¹⁴² Diversity within boards, a hot topic in the world of corporate governance, should also be looked at for the same reasons in the area of fiduciary effectiveness. Additional research is also needed on gathering the data on professional backgrounds of the individuals serving on boards. It is well understood that having a background in finance, accounting and investments is an important component of overall effectiveness, but to what degree? Survey data in this area could be useful.

Globally change is also afoot. Recently, the Bundesbank in Germany publicly aired its thoughts about extending the retirement age in by two years to begin addressing the looming demographic time bomb of their pension system.¹⁴³ Extending this research to look at country-by-country comparisons would be an important undertaking that should be considered as this is not only a U.S. problem, but a developed world problem, and may also eventually impact the emerging market countries, such as China.

¹⁴² Marriage, Madison, "Pension pay dilemma becomes acute-Retirement schemes torn between attracting talent and budget restraints", *Financial Times*, February 7, 2015

¹⁴³ Look, Carolyn, "Bundesbank floats higher retirement age in German pension debate", *Bloomberg*, August 15, 2016

Gathering data not just on public pensions, but also private pensions, foundations and endowments and trusts is also another area for further research. As discussed throughout, fiduciaries and beneficiaries of all colors and stripes could benefit from better knowledge and transparency over managed fund programs.

Finally, some investigation into what the implications of a protracted period of low interest rates are, and how it is changing the complexion of investment funds around the world, should be examined. Recent research by the investment consulting firm, Callan, has pointed to how public pension funds have pivoted away from safe, higher yielding bonds to other, more risky, asset classes just to earn the target rate of return.¹⁴⁴ This aspect alone may prove to give greater urgency to better forms of fiduciary effectiveness in the future.

Concluding Remarks

While this topic has increasingly gathered attention over the last 20 years, industry and academia have either focused piecemeal on one or two aspects of asset owner governance (Ambachtsheer), focused on decision-making in relation to investment managers (Morningstar, Goyal & Wahal), or have limited their investigation to a single plan over an extended period of time (Matkin, et al). Many have overly relied on survey responses to discern conclusions around best practices (Spence Johnson, State Street), which firmly lack an empirical basis. The new empirical approach of this research revealed that the structure, process and engagement of boards is critical to sustaining effective performance on both a relative and absolute basis, and applies both cross-sectionally and longitudinally. Best practices on this basis were reviewed and recommended.

¹⁴⁴ Martin, Timothy W., "Pension Funds Pile on Risk Just to Get a Reasonable Return
An investor used to get a 7.5% return by holding safe bonds: To earn that now, research finds, takes a more volatile mix", *Wall Street Journal*, May 31, 2016

In closing, a quote from a 2014 Harvard Business Review article by the authors of the *Focusing Capital on the Long Term (FCLT)* initiative:¹⁴⁵

If asset owners and managers are to do a better job of investing for the long-term, they need to run their organizations in a way that supports and reinforces this.

¹⁴⁵ http://www.cembenchmarking.com/Files/Documents/Research/Pension_Governance_and_LT_Investing.pdf

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Appendix A

Definitions of Key Terms¹⁴⁶

Asset Allocation - Asset allocation is the implementation of an investment strategy that attempts to balance risk versus reward by adjusting the percentage of each asset in an investment portfolio according to the investor's risk tolerance, goals and investment time horizon.

Asset Owner – An asset owner is any organization that has a pool of funds for investment including pension funds, foundations and endowments. Also known as an institutional investor.

Board of Trustees / Directors - An appointed or elected board that supervises the affairs of a public or private organization, i.e. the board of trustees of the university, the board of a public company. The board sets the policies of the organization, and appoints (and terminates) senior management personnel.

Endowment – A gift of money or income producing property to a public organization (such as a hospital or university) for a specific purpose (such as research or scholarships). Generally, the endowed asset is kept intact and only the income generated by it is consumed.

Foundation – An organization established from donated funds, for the purpose of donating funds (grants) to others.

Fiduciary – One that holds a fiduciary relation or acts in a fiduciary capacity (Merriam-Webster).

Fiduciary Duty - Fiduciary duty represents a “cluster of obligations” owed by one person, the “trustee” or “fiduciary” toward another, the “cestui” or “beneficiary”, regarding

¹⁴⁶ Unless otherwise noted, Investopedia.com and Businessdictionary.com.

an identified subject matter, which is referred to as the “res” or “subject of the trust” (Chodos, 2000).

Governance - Establishment of policies, and continuous monitoring of their proper implementation, by the members of the governing body of an organization. It includes the mechanisms required to balance the powers of the members (with the associated accountability), and their primary duty of enhancing the prosperity and viability of the organization. See also corporate governance.

Group (Organizational) Dynamics – is defined in the Blackwell Dictionary of Social Psychology as what happens when people interact with one another, noting that there are differences between what occurs and what is expected to occur given groups’ cultures and structures.

Investment Committee – The governing body that is charged with overseeing institutional investments, monitoring staff and the investment consultant and developing investment policies for board approval.

Investment Consultant - An individual or business that provides institutional or high-net-worth investors with long-term investment planning in exchange for a fee. An investment consultant monitors a client’s investments and makes recommendations to help them achieve their long-term goals (Financial Times Lexicon).

Investment Manager – A person or organization that makes investments in portfolios of securities on behalf of clients, in accordance with the investment objectives and parameters defined by these clients. Also, known as a money manager. This includes a variety of investment vehicles such as hedge funds, separate accounts, mutual funds and index products.

Pension Fund - A common asset pool meant to generate stable growth over the long term, and provide retirement income (annuity or lump sum payments) for employees when they reach the end of their working years and commence retirement.

Portfolio - Pool of different investments by which an investor seeks to make a profit (or income) while aiming to preserve the invested (principal) amount. These investments are chosen generally on the basis of different risk-reward combinations: from low risk, low yield (e.g. investment grade bonds) to high risk, high yield (e.g. junk bonds) ones; or different types of income streams: steady but fixed, or variable but with a potential for growth.

Risk-adjusted return - A concept that refines an investment's return by measuring how much risk is involved in producing that return, which is generally expressed as a number or rating. Risk-adjusted returns are applied to individual securities and investment funds and portfolios. There are five principal risk measures: alpha, beta, r-squared, standard deviation and the Sharpe ratio. Each risk measure is unique in how it measures risk. When comparing two or more potential investments, an investor should always compare the same risk measures to each different investment in order to get a relative performance perspective.

Modern Portfolio Theory (MPT) - A theory on how risk-averse investors can construct portfolios to optimize or maximize expected return based on a given level of market risk, emphasizing that risk is an inherent part of higher reward. Also called "portfolio theory" or "portfolio management theory." According to the theory, it's possible to construct an "efficient frontier" of optimal portfolios offering the maximum possible expected return for a given level of risk. This theory was pioneered by Harry Markowitz in his paper "Portfolio Selection," published in 1952 by the *Journal of Finance*.

There are four basic steps involved in portfolio construction: 1) Security valuation, 2) asset allocation, 3) portfolio optimization, and 4) performance measurement.

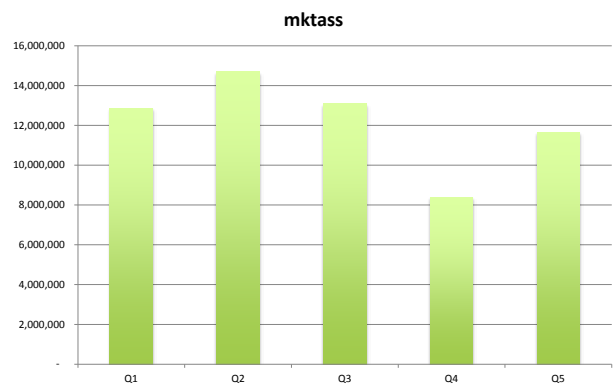
Discount Rate - The discount rate reflects what the plan's assets can reasonably be expected to earn over the long term.

Funding Ratio - The ratio of an annuity or pension's assets to its liabilities. Funding ratios above a one will indicate the pension or annuity can cover all obligated payments. Ratios below a one will reflect it is unable to make payments or may be in jeopardy of not being about to make payments at a later time.

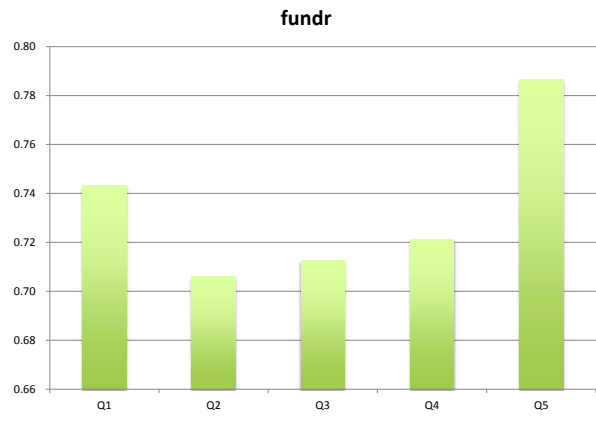
Appendix B

Governance Factors By Quintile

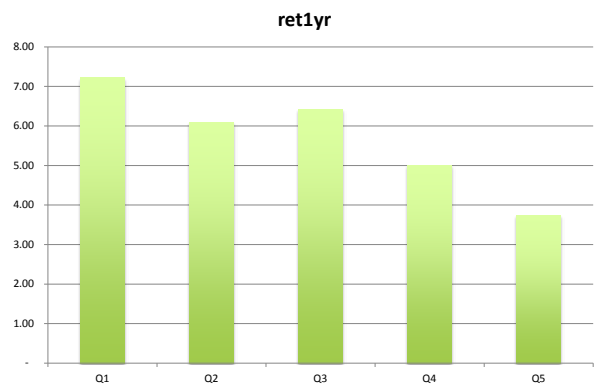
5 YR Average FEQ – Total Assets
By Quintile, US\$'s in '000s



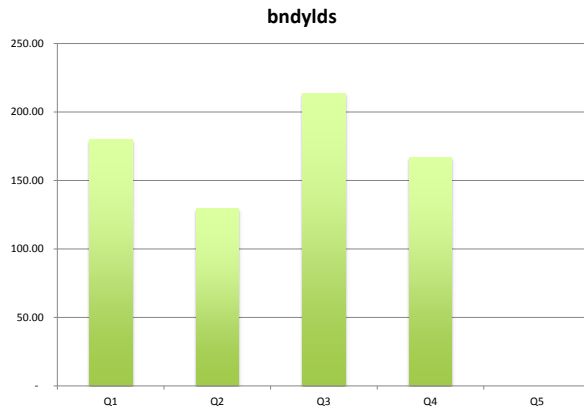
5 YR Average FEQ – Funding Ratio
By Quintile



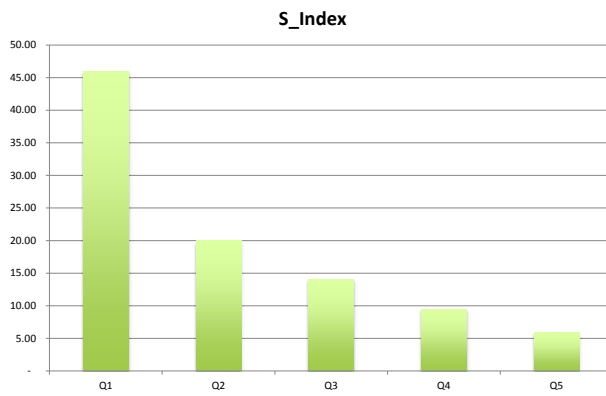
5 YR Average FEQ – Investment Returns
By Quintile, Percent



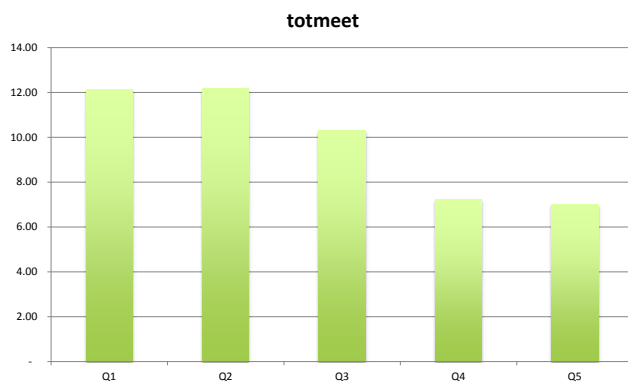
5 YR Average FEQ – Bond Yield Spreads
By Quintile, Basis Points



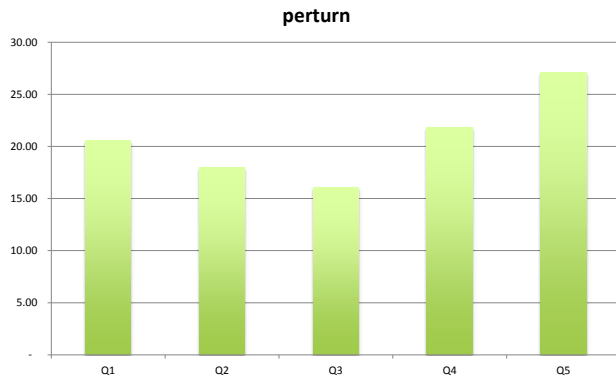
5 YR Average FEQ Score
By Quintile



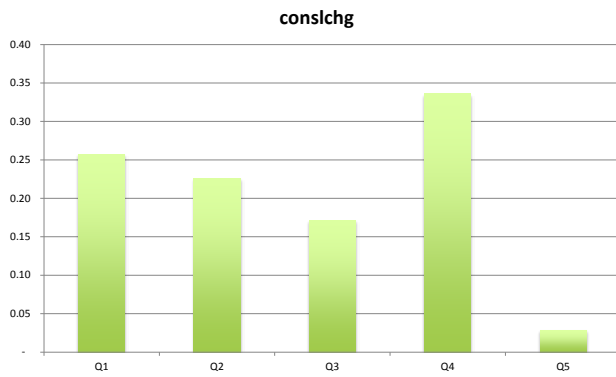
5 YR Average FEQ – Total Meetings
By Quintile



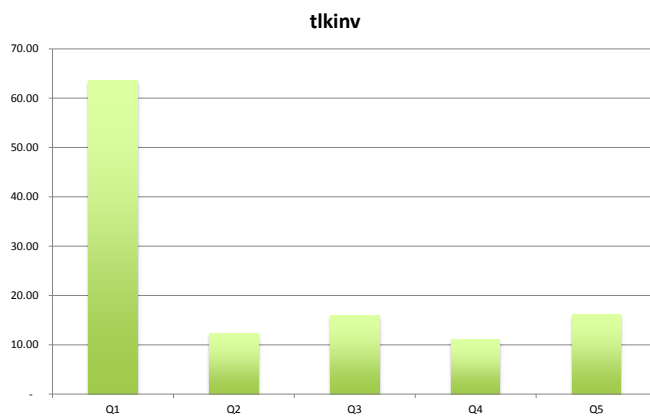
5 YR Average FEQ – Board Turnover
By Quintile, Percent



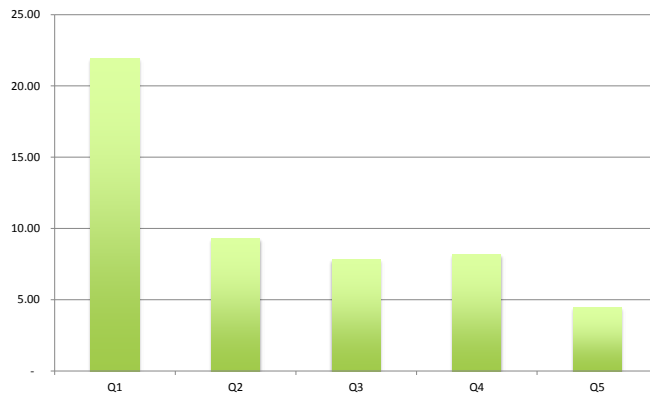
5 YR Average FEQ – Consultant Turnover Ratio
By Quintile



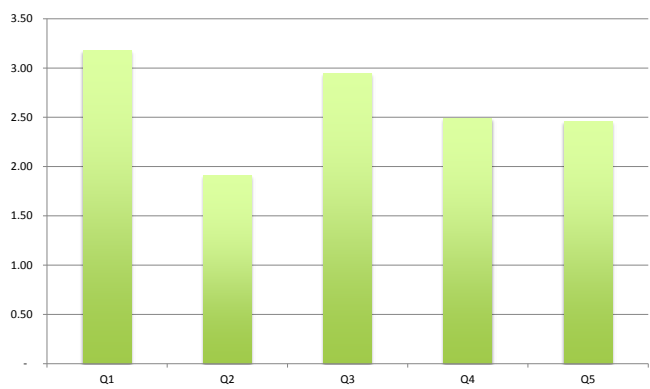
5 YR Average FEQ – Key Word Counts
By Quintile



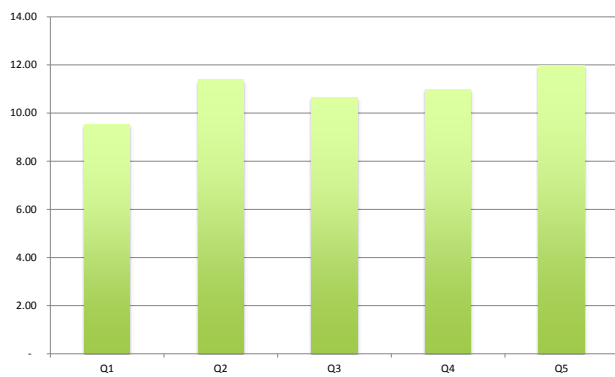
5 YR Average FEQ – Meeting Minutes Pages
By Quintile
pages



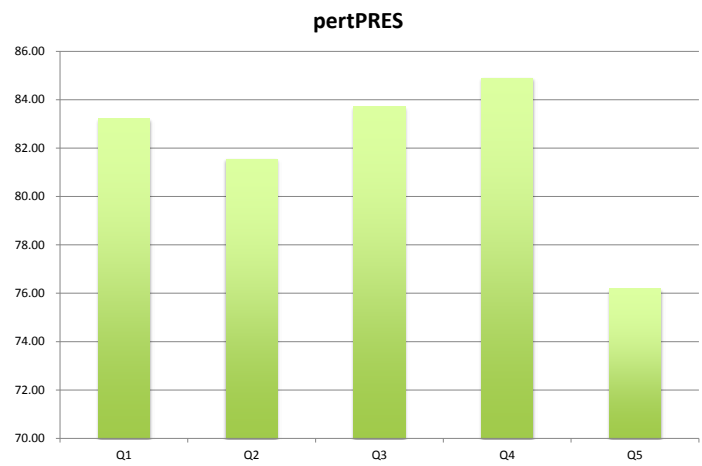
5 YR Average FEQ – Meeting Duration
By Quintile, Hours
durhr



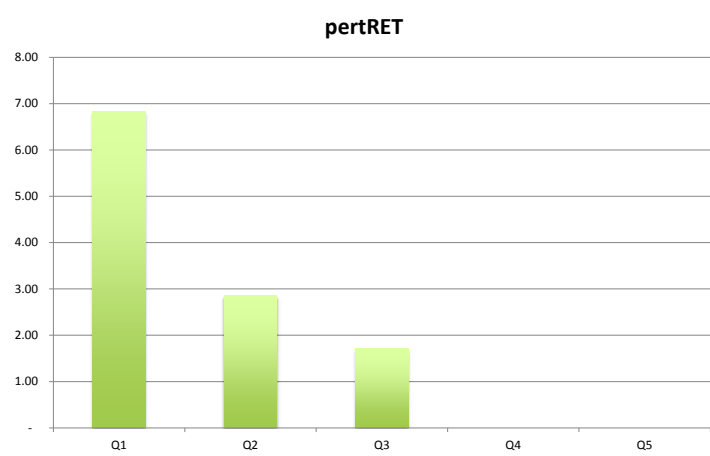
5 YR Average FEQ – Board Size
By Quintile
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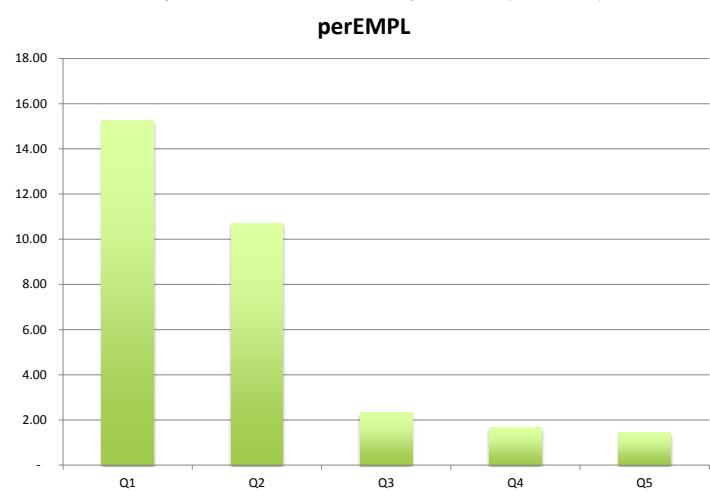
5 YR Average FEQ – Attendance
By Quintile, Percent



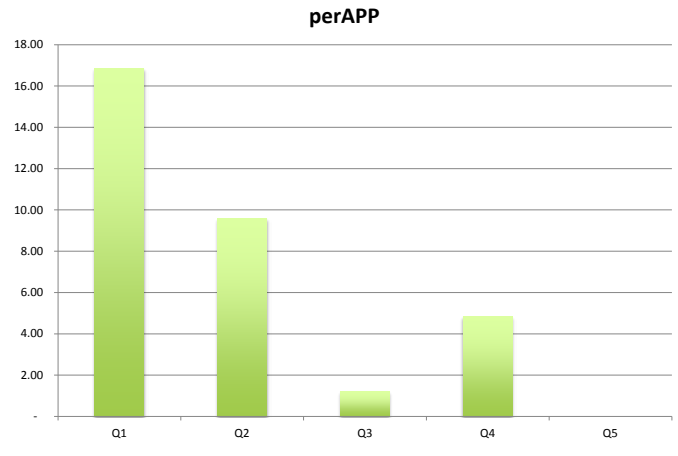
5 YR Average FEQ – Retirees
By Quintile, Board Composition (Percent)



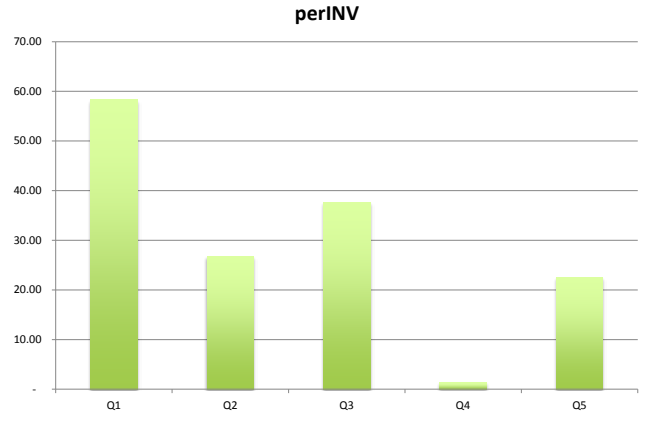
5 YR Average FEQ – Employees
By Quintile, Board Composition (Percent)



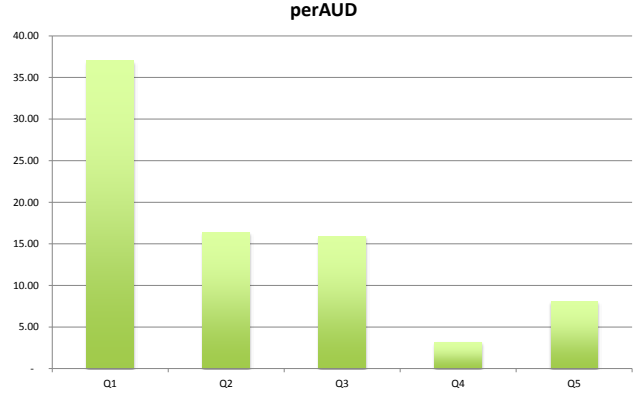
5 YR Average FEQ – Political Appointees
By Quintile, Board Composition (Percent)



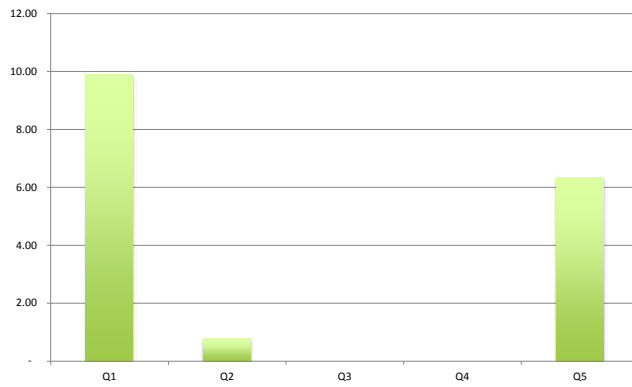
5 YR Average FEQ – Investment Committee
By Quintile, Percentage of Board Serving



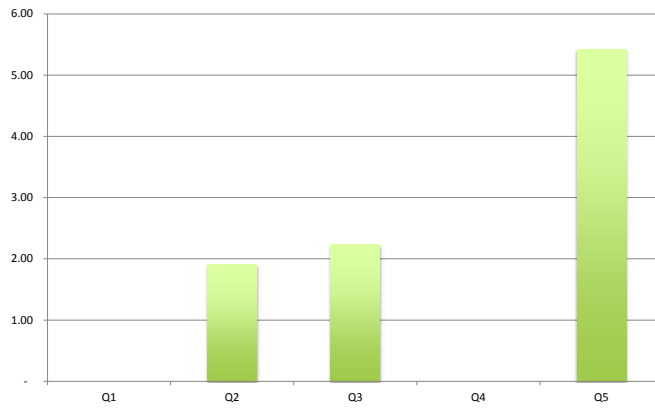
5 YR Average FEQ – Audit Committee
By Quintile, Percentage of Board Serving



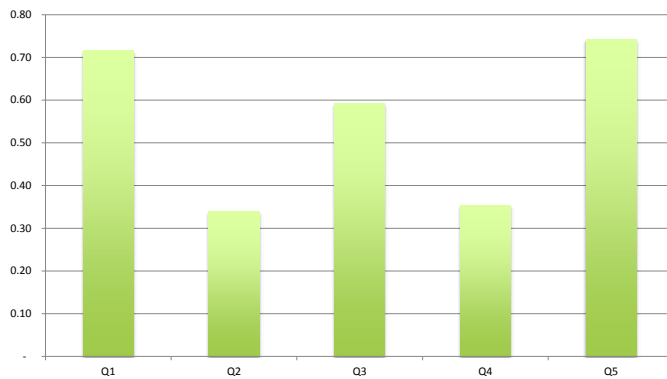
5 YR Average FEQ – Staff
By Quintile, Participation (Percent)
perSTF



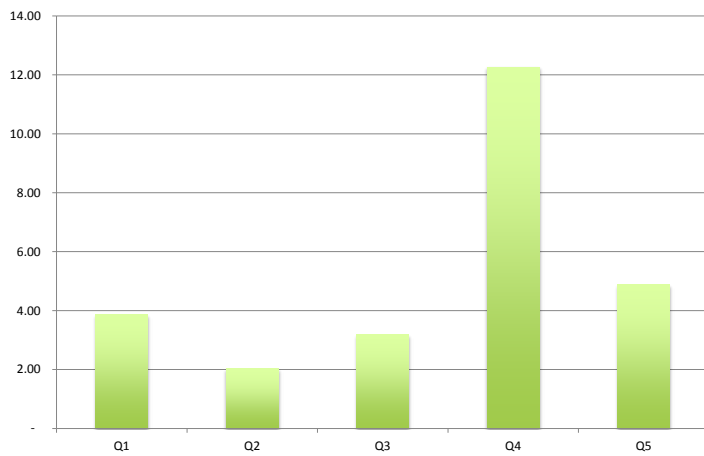
5 YR Average FEQ – Treasury
By Quintile, Participation (Percent)
perTRS



5 YR Average FEQ – Consultant
By Quintile, Participation (Ratio)
CNSpres

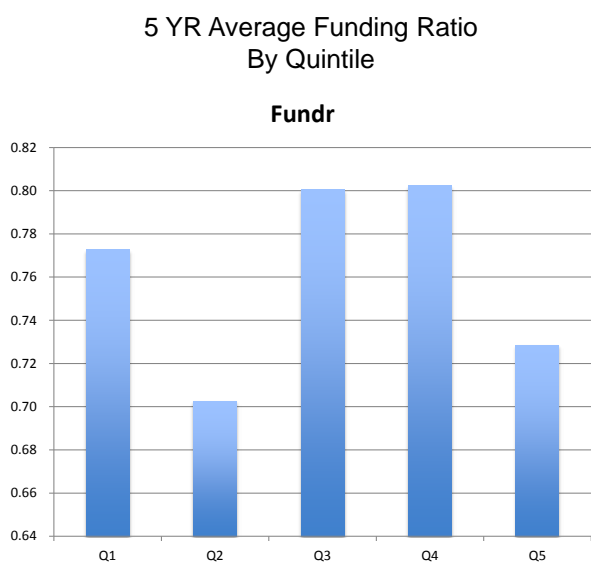
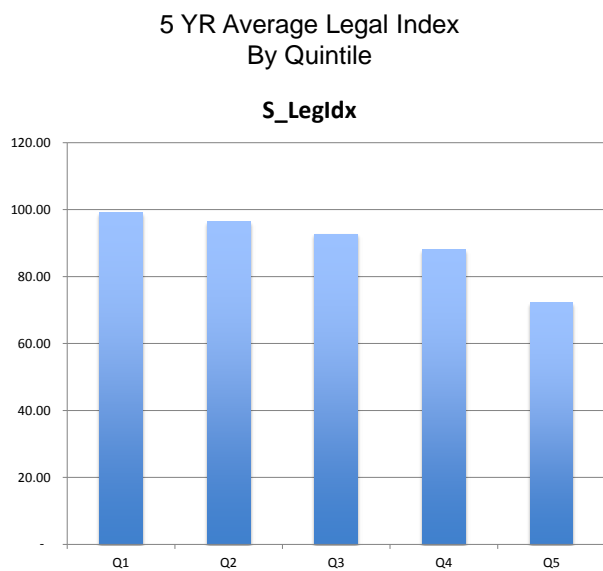


5 YR Average FEQ – Board Chair
Turnover, By Quintile (Percent)
pertrnch

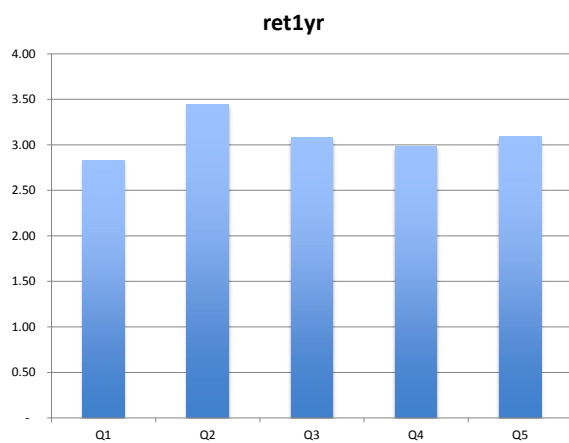


Appendix C

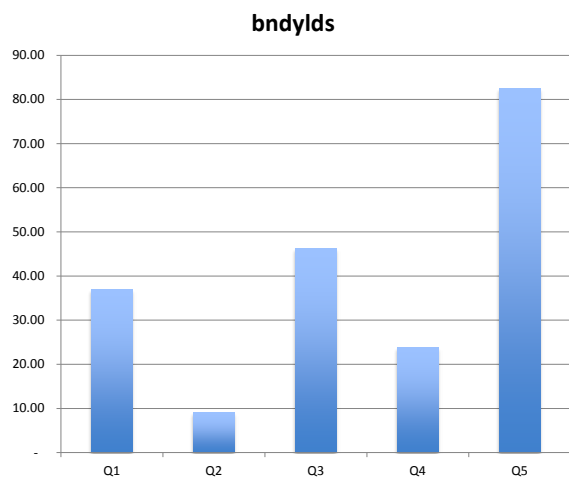
Legal Factors By Quintile



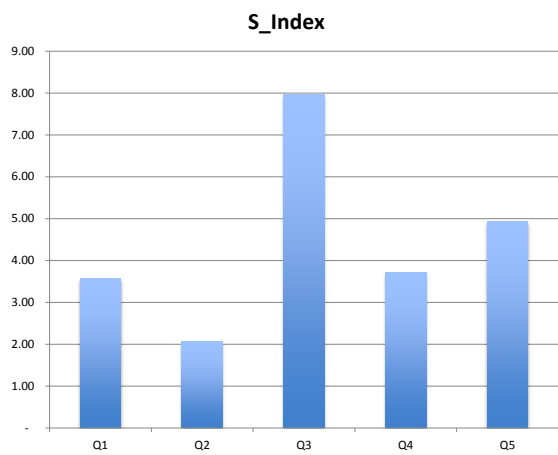
5 YR Average Investment Returns
By Quintile



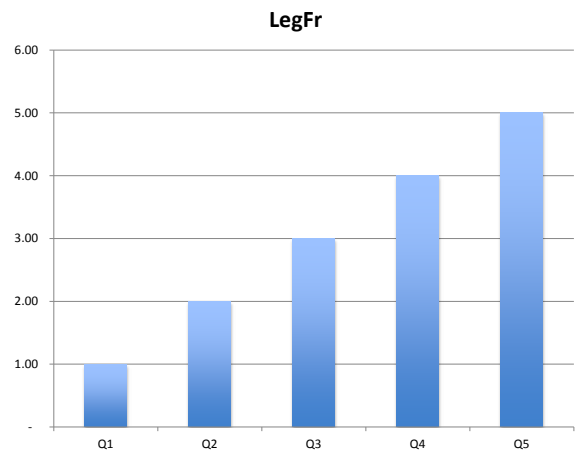
5 YR Average Bond Yield Spreads
By Quintile



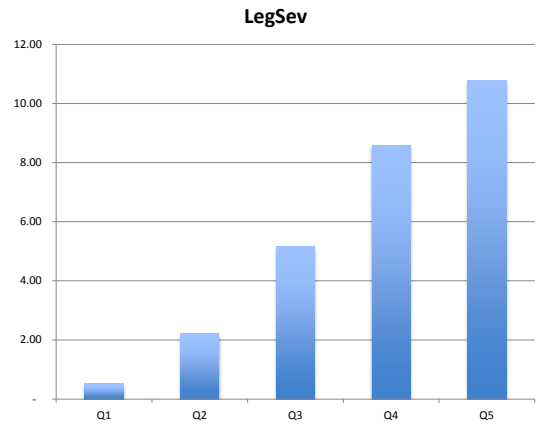
5 YR Average FEQ Index
By Quintile



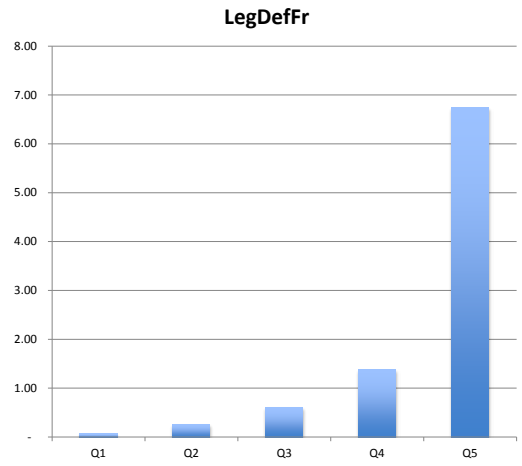
5 YR Average Legal Case Frequency
By Quintile



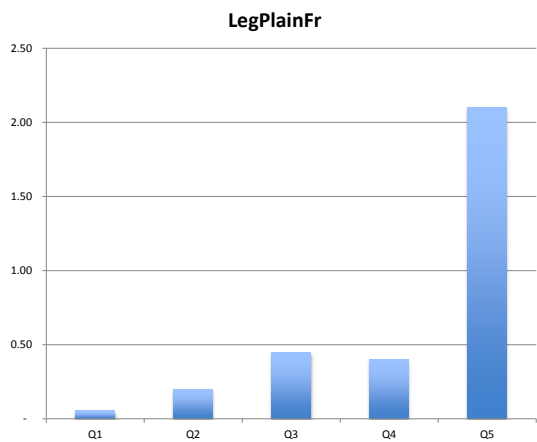
5 YR Average Legal Case Severity
By Quintile



5 YR Average Case Frequency, Plan as
Defendant, By Quintile



5 YR Average Case Frequency, Plan as Plaintiff, By Quintile



Appendix D**Ph.D. Final Examination**

Final Examination

Submitted in Partial Fulfillment of the Requirements for the Doctoral Degree in the
Interdisciplinary Ph.D. Program (INPR)

By Christopher K. Merker, CFA
Ph.D. Candidate
Interdisciplinary Ph.D. Program (INPR)
Marquette University

December 8, 2016

Advisory and Examination Committee

John Davis, Ph.D.

Nadelle Grossman, J.D.

Stephen Guastello, Ph.D.

Sarah Peck, Ph.D.

Farrokh Nourzad, Ph.D.

Paul Secunda, J.D.

Question 1 - *What would you identify as three key characteristics that make corporate boards different than pension boards? How do these three characteristics improve or detract from pension board functioning, i.e., trustees from fulfilling their fiduciary duty? (Sarah Peck)*

While I believe there are many similarities between the two types of organizations (for one that they are both charged with “earning and returning”), there are indeed some material differences; material in the sense that they directly impact the fiduciary effectiveness of boards. They are: 1) key differences in compensation structures; 2) key differences in external forces for governance discipline (i.e., a lack of a change of control market for public pensions); and 3) key differences in the nomination or appointment process (i.e., a political process of appointment for public pensions).

Turning to **compensation**, let us first acknowledge there has been no academic work done in this area for public pensions, so anything I share here is strictly anecdotal in nature. There, of course, is plenty of research on corporate boards, and especially due to the human resource/compensation/benefit consulting industry served by organizations like Hewitt and tracked and reported by proxy advisory firms such as ISS, board remuneration is essentially standardized today and relatively consistent.

Public pensions, however, are inconsistent at best; some board members are paid, and many are volunteers, and this inconsistency exists not just across organizations but also within the organizations themselves. Let us look at CalPERS for example. In recent times, five of the 13 board members receive extraordinary compensation relative to the others. This subgroup within the board’s distinguishing characteristic? They are public employees being compensated for taking time away from their jobs.¹⁴⁷ Some board members receive only a few hundred dollars a month, while others are paid tens of thousands of dollars per year. Among the five in the ’11-’12 period the top earner took home \$369K and the bottom,

¹⁴⁷ Ortiz, Jon, “Pay for CalPERS board members varies widely”, *Sacramento Bee*, November 22, 2014 <http://www.sacbee.com/news/investigations/the-public-eye/article4071012.html>

\$62K. Other members earned only \$100 per meeting, and a final category of members, earned nothing; they were strictly volunteers.

Compensation for paid staff is also an issue, and it is widely known that public pensions struggle to attract talent away from the private sector, as salaries are dictated by law, with little to no flexibility to award bonus or additional compensation based on performance.

Compensation that is too low or inconsistent, of course, can impede the effectiveness of fiduciaries. Inconsistent incentive structures can mean less engagement and higher turnover, aside from the issue of the quality of recruitment for these positions in the first place. Corporate board members generally do not suffer from being underpaid or paid inconsistently. Moreover, many corporate board members are compensated with some form of equity, which serves to better align their interests with shareholders.

The next key difference between corporate boards and pension boards (specifically public pension boards), is that there is a significant difference in **external forces for governance discipline**. What I mean by this is that if governance meanders or fails in a corporation, “bad stuff” starts to happen, and not necessarily in this order: First, the stock price begins to fall, which impacts any shareholder including board members. Then external sources of funding may dry up as bondholders and lenders withdraw support. Shareholders will also begin to litigate. Next, as the stock becomes cheap, an activist investor or strategic competitor may seek to take control of the company by making a tender offer to shareholders or undertaking a proxy fight. Ultimately, in the case of bankruptcy, the court may order liquidation of the assets, or award creditors with control of the company. The main point is that there are several external mechanisms to enforce disciplined performance from a governance standpoint at virtually every step.

In the case of a public pension, there is really only one source of external pressure on fiduciaries. A pension can become insolvent, although even here it is likely to be backstopped by the state government. Short of a true “bankruptcy”, the only form of external pressure is the municipal bond market, although individuals can also pursue litigation. If municipal bond market investors perceive financial risk to the overall municipality or state due to its pension funding obligations, they will “walk with their feet” and sell or not purchase the bonds of the municipality, and thereby drive up the bond yields or interest costs, which in turn will drive up the financing costs to the municipality. This has the effect of not just enforcing discipline on the pension board, but the entire municipal government. The drawback of having only one primary form of external pressure is that it can come late in game, as we have witnessed in the city of Chicago, long after that pressure was needed for corrections to be made.

Finally, **the process of board appointment** is very different for public pension and corporations. Board members in companies are typically recruited by the CEO and nominating committee and then elected by shareholders, but this can be contested by outside entities in the form of a proxy fight, as mentioned earlier. Not only are people recruited for their knowledge, abilities and connections, but they are also appointed for control. For public pensions, board members are either appointed by the government (typically the governor in the case of state pensions), elected by the unions or end up serving as part of their staff appointment (i.e. the state treasurer). We have found in our research that organizations tend to have better governance with appointed rather than elected members, and I suspect this is because the governor in such cases acts more like a CEO, appointing individuals to serve based on similar criteria (i.e., knowledge, abilities and connections), rather than through the other process of union appointment, where the

candidate may not have any specific credentials for the position other than seeking out appointment.

Question 2 - *What are potential reporting bias that are created when your sample drops from 163/ 161 to 35 pension funds? How could you test for these biases? (Sarah Peck)*

In statistics the absolute accuracy of any study is only possible when one examines the entire population by conducting a census. However, accuracy is not linear. The accuracy of a sample comprised of half the population is not 50%, but very nearly 100%. Good accuracy levels may be achieved with small sample sizes, so long as the sample is representative. If the sample is not representative, then there will be error in the results, which means that the average values obtained through the study are different than the true average values of the population we targeted.

So, how do we test for this, especially in the case of this study, where the sample was 35 out of an original study group of 163 from an overall population of 6,300?

One method is to test whether several statistics that are descriptive of a distribution are the same in the sub-sample as the original sample. For example, we could conduct tests for:

- mean difference
- median difference
- stochastic dominance
- difference in variance

We could also explore tests for equivalence of all such measures by combining inferences from difference and equivalence tests. TOST, an acronym for “two one-sided tests”, is a straightforward way of constructing a test of the null hypothesis that two population statistics differ by no more than a small equivalence threshold.

Another method is to conduct a Kolmogorov–Smirnov test (KS test). This is a nonparametric test of the equality of continuous, one-dimensional probability distributions that can be used to compare two samples (two-sample KS test). The KS statistic quantifies a distance between the empirical distribution functions of two samples. The distribution of this statistic is calculated under the null hypothesis that the samples are drawn from the same distribution.

Question 3 - *As you are aware, the use of principal components analysis (PCA) as a data-reduction technique can generate bias in estimation results. (Farrohk Nourzad)*

- a. *In those cases, where the use of principal components as a data-reduction technique does generate bias in the results, exactly what will be biased, the point estimate or the standard error associated with the principal component regressor?*

The point estimate of the regression coefficient associated with the principal component regressor.

- b. *Under what conditions would the use of principal components not bias the estimation results?*

While according to Enns (1979) there are no conditions under which PCA will not bias estimation results, bias will decrease as more components are added to the principal components regression.

Question 4 - *There are three approaches to estimating linear regression models with binary dependent variable: the linear probability model, the probit model, and the logit model. (Farrohk Nourzad)*

- a. *Briefly discuss the advantages and disadvantages of each of these methods.*

The main advantage of the linear probability model is that it is simple to use. The main disadvantage is that the model doesn't work well if probability estimated values are not within the (0,1) range. A better approach is using the logit or probit model.

Generally, the setup and use of the logit and probit approaches are the same. The coefficients from a probit model will be somewhat different to those from a logit model since the transformation from the coefficient to a probability in probit is different from the equivalent transformation in logit. However, logit and probit will produce similar predicted probabilities because maximum likelihood estimators choose the parameters so that π_i is as close to 1 when $y_i=1$ and π_i is as close to 0 when $y_i=0$.

The advantage of the logit and probit approaches is that the coefficients will tell you the direction and statistical significance associated with the effect of increasing an independent variable just like OLS coefficients. The main disadvantage is that you cannot assess marginal impacts of the coefficient, as in the “amount of change” in x will impact a certain “amount of change” in the probability of y . In other words, the coefficients tell you nothing about the magnitude of the effect of a change. However, these can be transformed to provide an estimate.

- b. *Under what condition(s) should one use the probit model instead of the logit model?*

Both methods will yield similar - though not identical - inferences. Logit is more popular in health sciences like epidemiology partly because coefficients can be interpreted in terms of odds ratios. Probit models can be generalized to account for non-constant error variances in more advanced econometric settings (known as heteroskedastic probit models) and for this reason are used in some contexts by economists and political scientists.

- c. *As you are aware, the estimated coefficients of probit and logit models cannot be interpreted as marginal effects. However, one can transform them to represent marginal effect. Please transform the estimated coefficients of your probit model (**Model 6** on page 169 of your dissertation) that appear in **Table 21 (2b.)** on page 171 and interpret the results.*

There are two methods of transforming the data in the model into estimates that allow measurement of marginal impacts. I am applying the first method as taught by Dr. James McGibany. This method involves using “fact regression” of the mean values of the variables.

The first step involves calculation of a “Z-score” by taking a weighted average of the product of the coefficient estimates of each regressor times the average right-hand side variable mean. In this case, I calculated a Z-score of 2.94625. Then using a density function, I converted the Z-score into a scale factor, for which I calculated a scale factor of 0.0052.

The final step involves multiplying each estimated coefficient by the scale factor. I was thereby able to convert the estimated coefficient into a marginal impact estimate on the probability that event “1” occurs. In this model, an event “1” is the condition of effectiveness as defined by a funding ratio greater than 0.50 for a given public pension plan. Here is the table of marginal impact estimates with interpretations, along with the original estimate of coefficients from the model:

Regressor	Coefficient	Marginal Impact Estimate	Interpretation
FEQ	0.064624	0.0003	A one-unit increase in the FEQ, is a 0.03% increase in the probability of effectiveness.
Legal Index	-0.041900	-0.0002	A one-unit increase in the Legal Index, is a 0.02% decrease in the probability of effectiveness.
Market Asset Value	-9.19E-08	0.0000	Size of the plan has no impact on the probability of effectiveness.
Equities	-3.263310	-0.0170	A one percent increase (standard deviation) in equity allocation is a 1.7% decrease in the probability of effectiveness.
Fixed Income	-1.146770	-0.0006	A one percent increase (standard deviation) in fixed income allocation is a 0.06% decrease in the probability of effectiveness.
Real Estate	-2.575224	-0.0134	A one percent increase (standard deviation) in real estate allocation is a 1.3% decrease in the probability of effectiveness.
Alternatives	-2.853072	-0.0148	A one percent increase (standard deviation) in alternatives allocation is a 1.5% decrease in the probability of effectiveness.

Cash and Equivalents	-1.520448	-0.0079	A one percent increase (standard deviation) in cash allocation is a 0.79% decrease in the probability of effectiveness.
Total Beneficiaries	0.406256	0.0021	A one percent increase (standard deviation) in total beneficiaries is a 0.21% increase in the probability of effectiveness.
Required Contribution Rate	-0.146158	-0.0008	A one percent increase (standard deviation) in required contribution rate is a 0.08% decrease in the probability of effectiveness.

Question 5 - *You talk about fiduciaries duties generally under trust law and then you discuss more specifically fiduciary duties of public pension trustees. Are general fiduciaries duties under trust law the same or different than duties that apply under state law to public pension trustees? If different, in what material respects do they differ? (Paul Secunda)*

General fiduciary duties under trust law are similar but not the same under state law as compared to the state law governing public pensions. Both find the same root in common law, and many of the same tenets found in the 1994 Uniform Prudent Investor Act (UPIA). However, state public pension systems are governed by a series of legislative acts and state laws, whereas the Uniform Trust Code governs trusts, which has been adopted in a majority of states including Wisconsin.

So, the first major difference is legal inconsistency. Because there is a patchwork of legislation that governs state pensions across the country and no set of uniform laws, it is impossible to say that every state follows the same set of rules as the Uniform Trust Code because virtually every state is different. An effort to harmonize these different sets of rules

fell to naught in the early 2000's with the Uniform Management of Public Employee Retirement Systems Act (UMPERSA), which was only adopted in two states.

Out of this come two main critical differences specific to general fiduciary rules. One criticism is that conflicts of interest are not adequately addressed by states for public pensions, and this has been one of the main issues on the agenda of those calling for harmonization. In particular, rules for who serves and in what capacity are widely varying. Additionally, many have voiced criticism over the amount of "social activism" being engaged by public pensions that puts retirement beneficiaries secondary to plan objectives, which, of course, potentially violates the duty of loyalty.¹⁴⁸

Question 6 - *One of the more difficult areas of pension investing for public entities is "social investing." To what extent should public pension trustees be able to take environmental, social, or governance (ESG) issues into account when making investment decisions, while still acting in the best interest of pension plan beneficiaries? When calPERs decided not to invest in tobacco companies for ESG reasons a number of years ago, were such actions consistent with their fiduciary duties to their pension beneficiaries? (Paul Secunda)*

I think, as a practical matter, the ESG movement is here to stay regardless of one's position or viewpoint on ESG. For those who believe in the double (or triple bottom) line, they would say that there is no conflict and that both objectives, of acting socially responsibly and supporting beneficiary objectives, are not mutually exclusive, but are actually mutually reinforcing. There is a large body of academic research over the last 30 years that provides evidence of this. A recent study by Friede, Busch and Bassen (2015) conducted a meta-analysis of 2,000 ESG studies since 1979 and concluded that 90% of the studies had statistical evidence of a relationship between ESG factors and positive financial results.¹⁴⁹

¹⁴⁸ <http://www.manhattan-institute.org/sites/default/files/R-JCSM-0316.pdf>

¹⁴⁹ https://www.db.com/newsroom_news/ESG_study_Jan16.pdf

I would put myself into that camp with some caveats. The explosion in asset managers over the last couple of years that describe themselves as “ESG-integrated” seems to me in general to lack any qualification whatsoever, and comes to the market with a distinct standards issue analogous to the “organic” farming movement of 30 years ago (In the beginning there was a definite lack of standards for those claiming their products were “organic”. See Ellsworth (2001), for a discussion on the history of the development of standards and regulation for the organic food industry).¹⁵⁰ And so I think the problem for asset owners going forward will be first to define their specific ESG objectives, and then audit or enforce those objectives under their given mandate. Eliminating tobacco stocks from a portfolio is very straightforward and simple to process. Having a manager control the carbon footprint of their portfolio is a different matter altogether. Holding asset managers accountable to a given set of objectives is key.

I also believe there is room for debate over what our governments say qualifies as ESG. Certain values that are controversial in the domain of politics or public policy should not be immune when it comes to small groups of people making investment decisions with public funds on behalf of millions of beneficiaries. Providing capital to certain social objectives is more than just moral support, it is promoting growth to industries that have material impacts on society. If a government wishes to remain agnostic and invest in general without any set of ESG criteria, that is one thing, but when opening the door to ESG, the expression of a certain set of values now subjects itself to a certain level of public scrutiny that may not have existed prior to that governance decision.

Question 7 – *What is fraud, how does an investment manager usually commit fraud, and why does fraud so significantly impact a firm’s FEQ? (Nadelle Grossman)*

I find the online Free Legal Dictionary definition of fraud a good one:

¹⁵⁰ <https://dash.harvard.edu/bitstream/handle/1/8889458/Ellsworth.pdf?sequence=1>

“A false representation of a matter of fact—whether by words or by conduct, by false or misleading allegations, or by concealment of what should have been disclosed—that deceives and is intended to deceive another so that the individual will act upon it to her or his legal injury. Fraud is commonly understood as dishonesty calculated for advantage. A person who is dishonest may be called a fraud. In the U.S. legal system, fraud is a specific offense with certain features. Fraud is most common in the buying or selling of property, including real estate, Personal Property, and intangible property, such as stocks, bonds, and copyrights.”¹⁵¹

An investment manager can commit fraud in a number of ways. One of the better-known - if not most common - forms of fraud is the so-called Ponzi scheme. This simple scheme involves making “earnings payments” to investors from funds raised from new investors. The secret to keeping a Ponzi scheme going is to continue finding new investors. Typically, the jig is up when the Ponzi scheme perpetrator fails to find new sources of funding and can no longer keep up with the payments to its existing base of “investors”, as was the case with Bernie Madoff, who perpetrated the largest Ponzi scheme in history, which impacted thousands of individual and institutional investors to the tune of \$50 billion. He had kept his Ponzi scheme going for a very long time, over 20 years, and the scheme only became apparent (despite some earlier warnings from whistleblowers who were ignored by authorities) during the Global Financial Crisis (GFC) in 2008. A wave of redemptions by investors hit hedge funds, who in an act of general panic, attempted to turn their investments to cash. When Madoff was unable to keep up with redemptions because there were in fact no underlying assets, the scheme revealed itself as fraud.

¹⁵¹ <http://legal-dictionary.thefreedictionary.com/fraud>

The SEC has a comprehensive list on its web site of common forms of fraud involving investments that range from “pump and dump” schemes to “internet and social media” fraud.¹⁵²

Fraud can, of course, impact an organization’s Legal Index, as we identified in the study. Case severity was one of the two factors we identified as a key component of the Legal Index. Fraud ranked number one in the case severity scale. More specifically, as it relates to the FEQ, one of the six “super factors” of Fiduciary Effectiveness identified in the study has to do with process diligence, under which fraud can be one manifestation of poor diligence (and poor investment performance, of course, another). Based on our analysis, this accounts for approximately 10% of the FEQ measure. The other five factors relate to Board Composition, Engagement, Professionalism, Staff and Institutional Knowledge.

Question 8 – *Are fiduciary duties an effective way to hold investment managers accountable for their myopia? Why or why not? (Nadelle Grossman)*

If what is meant by myopia here is what is also known as the problem of “short-termism”, then the question is asking about an issue that is, as many have argued, largely systemic, rather than unique to asset owners and their investment managers.

The definition of myopia or “short-termism” is, simply put, a focus and emphasis on short-term performance versus long-term performance. By performance, I mean the financial performance of companies, and the investment performance of investments in those companies or other investments. The quarterly schedule public companies are on to report earnings and provide guidance is an example of a culture that reinforces a short-term view. How many managers are compensated through stock and stock options reinforces a focus on short-term performance. One example of short-termist behavior is the preference

¹⁵² <https://www.investor.gov/protect-your-investments/fraud/types-fraud>

for companies to buy back stock rather than make new investments in their businesses, which often requires a long-term commitment. Buying back stock has the immediate and gratifying effect of boosting one's earnings per share by shrinking the denominator, number of shares. I think, by the way, the diminishing number of new public offerings and companies converting from public to private companies are a reaction to short-termism.

The other related issue feeding into this is the separation of ownership from control. Whether its millions of individual stockholders invested through their IRA accounts or millions of beneficiaries that are or (hopefully) will receive benefits from their pension plan, the disaggregation of owners from direct control over the investment itself has fed into this "short-termist" culture. Investment managers report and are also reviewed on a quarterly basis, just as their underlying investments are. The shifts they make in a portfolio most often are not taken within the context of a long time-horizon.

With this as background, let us turn to the question of whether fiduciary duties can keep anyone within this cycle accountable for myopia or "short-termism". I would say first, this depends in part on the time horizon of the investment vehicle. Pension plans can take a long-term view typically, as the average duration of funds tends to be around 13 years based on the projected liabilities; college endowments even longer in perpetuity; and bank overnight funding operations, of course, much less so.

I would also say that some fiduciaries use this position of long-term investment horizons to take a longer-term view. The extent of investor activism among some of the larger pension funds such as calPERS is an example of a longer-term orientation. The Yale endowment seems to take a longer-term view especially in the way it has promoted-ESG forms of investing, and expressed a preference for alternative investments, such as private

equity to invest for the long-term. It's predilection for hedge fund investing, however, does not support a long-term view. Hedge funds are notoriously short-termist.

On balance, though, I would say most fiduciaries fall into the short-termist trap, which is why we generally see lackluster governance and returns at least from the group we studied, public pensions, and it should not be surprising. The behavioral biases of human beings are well-documented, and investor myopia is high on the list. Under the aegis of fiduciary duty, it is quite easy for any investor or group of investors to justify a short-term approach to investing, as all they need to do is to document a process. Under the business judgment rule, a court will look the other way regardless of the approach, so long as the group had a quorum, everyone voted, and the meeting minutes were taken. So, the short answer is no, fiduciary duties are no defense against investor myopia. Education is. Professionalism is. Transparency is. These practices can make fiduciaries better, and persuade them to take a longer-term approach.

Question 9 - *What are the known relationships between group size, problem solving processes, and outcomes under general circumstances? Based on this information and the type of task involved, what would be the optimal configuration of a fiduciary board (or team)? (Stephen Guastello)*

This question essentially asks: Based on what we know about humans and group dynamics, how would I go about developing the perfect board for governing a dedicated investment fund? Because, under the theory, Fiduciary Effectiveness is a function of Structure, Process/Engagement and People, we would need to address each element accordingly.

Let us turn to the first part of the question about the known relationships between group size, problem solving and outcomes. The first thing we know is that smaller is better when it comes to board/committee size. The Ringelmann Effect, also known as "social

loafing”, is at play according to social psychology research (Latané & Harkins, 1979). The idea is that as people are added to a work group, one may believe they are adding more talent and hands to handle a task, when instead they are getting the opposite. People have a tendency to hide within a larger group, and not be accountable for tasks, as they operate under the assumption that someone else will do the work. In addition to finding evidence of this in psychological experiments, corporate governance research substantiates this as well. Empirical studies have shown that smaller corporate boards are more effective, and that relationship declines as board size increases from four to ten members (John & Senbet, 1998).

We also know that boards are challenged in two primary ways, by the time they have available to commit to the board, and the extent of their individual competence and experience. As the 2001 Myners’ Report found, “many trustees are not especially expert in investment”. They also have a range of biases that impact their ability to make good investment decisions. Layer on top of that, beyond the “bounded rationality” of each board member, the issue of differences in group dynamics. Some groups work very well together, while others do not. Some groups fall into being dominated by one or two group members, who are status-seeking, a common problem in my experience, but not necessarily any better informed in their discernments or judgments. One inherent challenge to boards is that unlike operational work groups that work day-to-day, as in an office or industrial setting, boards only get together every so often, maybe 12 times a year on the very high end; more often an average of 5 or 6 times. This makes it inherently difficult for people to form relationships and build trust. All of these factors combine to make effective group decision-making and problem solving a major hurdle.

So, what would I do in my organizational design to minimize these issues? Looking at Structure first. My board would be no more than five people. The entire board would be the investment committee, and at least two-thirds of the members would also serve on the audit committee. My board would turnover no more than every five years, and to accomplish this everyone would sign on for at least a three-year term, and terms would be staggered. I realized staggered boards are discouraged in corporate governance for the reason that they can be used as a takeover defense, but in this context I think it does serve to enhance organizational continuity. The board chair would serve at least a two-year term. Turnover can be a real problem for organizational continuity, and this was evident in the research. We address this, as identified in my research, as the Super Factor, Institutional Knowledge.

My board would also have no more than one elected representative if this is a public pension board, and the rest would be appointed or professional (i.e. staff leadership). Again, we found that appointed members versus elected members tended to improve the effectiveness measure, and I believe this is because those who were hand-picked for their talents and abilities versus found through a political process by an uninformed electorate of beneficiary retirees, tend to offer more. The board would also be compensated, and would be compensated fairly based on market rates as compared to corporate boards. My board members would also be limited in not serving on more than three other outside boards. There would be only one investment consultant because in my experience multiple consultants can confuse matters, although there, of course, may be other advisors, such as actuaries or accountants.

Then turning to process, my board would meet monthly. They would also meet for at least two hours, and for possibly up to a quarter of the meetings in the year for at least a

half day, maybe a full day, with breaks and activities in-between, that may be unrelated to the work at hand to foster relationships and build trust. They would be presented with meeting packets in advance that would tend to be more graphical in nature. As I learned in my research (and my Human Factors course), the way information is summarized, framed and presented is also important, especially in dealing with people and their cognitive biases. A good portion of the agenda, if not every meeting, would be focused on education and fiduciary training. I would have my board members attend conferences and workshops possibly in between or in lieu of the monthly meeting. The consultant and staff would be a key part of the agenda, and would drive much of the agenda. Having the consultant and staff participate in the meetings was also evident from the research.

Finally, on the people factor, at least half the board must have a background in investments. It would be great if the other half had a background in accounting, actuarial science or math, but I would settle for a business background of some sort. They should have some board experience, and having someone from a related field in academia would be a plus, as well. They should have some fiduciary training, which the organization will provide if they don't. They should have the ability to commit a certain amount of time to the job, plan on attending most meetings, and preferably in person. Also, the choice of the consultant and senior staff person are among the most important decisions of the group, and these people should turnover infrequently, but occasionally, to enhance continuity and institutional knowledge, and to also add a fresh perspective now and then.

Question 10 - *What are the principles behind program trading? What is known about their effectiveness as a decision-making tool? Do they present any new risks, and if so, how would those risks be managed by fiduciary boards (teams)? (Stephen Guastello)*

Program trading is known by many names including algorithmic trading, high frequency trading (HFT), arbitrage trading, etc. This is a highly controversial area of

investing, and the media has made much out of some of the perceived unfair trade practices and risks of this method in its application of computer science to financial markets. These methods are typically employed by hedge funds or proprietary trading firms, which trade on their own accounts.

Investopedia has a good definition of program trading:¹⁵³

“More broadly, program trading can be defined as all aspects of computerized trading, including algorithmic trading, high-frequency trading (HFT) and quantitative trading. Program trading is generally undertaken by institutional traders at hedge funds, brokerages, and HFT firms, as well as institutions like mutual funds and pension funds. It typically involves the purchase or sale of various shares in very large quantities.”

In the world of institutional investing, as it relates to asset owners such as pension plans, if an organization would like to make use of a program trading strategy typically it is but one of many strategies included in the portfolio, and to that end a pension would typically hire a hedge fund to run such a strategy.

In today’s world, hedge funds in general are falling out of favor for several reasons including their high fees and expenses, lack of transparency around underlying positions and trading activity and most of all, lackluster performance. When looking at broad hedge fund indexes relative to traditional markets including public equities and fixed income, hedge funds as a group have underperformed over the last ten years.

There are a number of possible explanations for that underperformance: 1) the number of hedge funds have proliferated over the last 20 years, at one point with over

¹⁵³ <http://www.investopedia.com/articles/active-trading/050214/perils-program-trading.asp>

8,000 funds (that is more than the number of listed public companies in the U.S. as a measure of comparison), and as more have come into the market, exploiting market inefficiencies has become more difficult with the increased competition; 2) the high “2 and 20” or “3 and 30” fee structures have sucked out most of the return (e.g., the case of the NY City Pension Plan, which had a large percentage of its portfolio in such strategies suffered public embarrassment recently for having made no earnings over the last ten years, while still paying out \$2 billion in management fees over that period of time to hedge funds); and 3) the high risk, unregulated and capricious nature of the asset class has meant high turnover in the space with the average life of hedge funds not much more than three years; and 4) strategies that purport to earn excess alpha, or even “risk-free” returns, are fleeting and in the long-run unreliable. As a result, there has been a recent backlash against hedge funds with a number of high profile asset owners quite publicly shutting down their hedge fund strategies, starting with calPERS two years ago.

This is not to say the top hedge funds are hurting; quite the opposite. The individuals running and working for these funds are among the wealthiest and most well-compensated people working in finance, or in business overall, for that matter, with many receiving many times the pay packet of the average CEO. These funds do well because they have done well for their investors, and some have been around a long time like Baupost, based in Boston, which started in the late 70's, or ASQ out of Connecticut.

Now, at it relates to risk in the financial markets, there have been some “events” over the past few years that have been triggered by program trading. The 2010 “Flash Crash” was first in a series of such events, which saw over the brief span of 25 minutes a huge decline in U.S. stock market indexes with some companies like Procter & Gamble, that

was trading in the \$40 range at the time, suddenly trading around \$1 per share. There was just another event last month in the currency markets involving the British pound.

While these make for big news events, from the perspective of an asset owner that is running a long-term portfolio, and carefully managing its liquidity needs, these have little to no impact on what these organizations are doing. First, they tend to be diversified across asset classes and investment managers. Secondly, they tend not to be raising cash from a portfolio at sudden points in time from highly volatile asset classes. These tend to be carefully planned and staged out from low volatile assets like short-term bonds. For an individual, who may be reacting to a news event, or is applying stop losses to positions, it can be, however, quite costly.

Question 11 - *You say (p. 4) that since 1985 the American percentage share of DB versus DC plans has shifted significantly to the latter. You also say (p. 15) that workers with access to DC plans represent over 80% of full-time working Americans. Your FEQ is intended to apply to U.S. public pension plans. How would your FEQ address the country's shift to DC plans? (John Davis)*

My FEQ is intended to address any type of institutional fund governance context. Public pensions just happen to be our sample study group. As I explain from p. 182 of the dissertation:

“The goal in this study was to find out what actually matters based on empirical measures, without the interference and noise of opinion. To do this we turned to the tools of corporate governance, a huge body of work that spans the last 30 years, and applied these methods to our examination of investment organizations to come up with comparable and comprehensible measures that carry statistical validity in their assessments. We sought to understand what makes for differences in organizations, their relative effectiveness, and what makes them effective on an absolute basis.

To do this we gathered data on U.S. Public Pension Plans. Their public policy import in their role in providing retirement security to millions of Americans notwithstanding, they produce data, which permitted depth to this investigation.”

This methodology theoretically may be applied to any organization that has a governance structure (i.e., a board or committee, staff and external service providers) including foundations, endowments, trusts and also, DC Plans i.e., 401(k) and 403(b) plans. Typically, the only difference between a DC and DB plan is that instead of the board and managers making investment decisions on behalf of beneficiaries, the plan participant is making the investment choice. Although, even there with improvements in plan design and technology, many DC plans now “channel” participants into a portfolio selection, so that many participants no longer even need to make decisions on allocation and manager selection from options within the plan beyond responding to a brief questionnaire. The oversight and operation of a DC plan still requires a governance structure.

Additionally, as noted in my literature review, there have been studies that have focused on DC plans alone. I give the example of Saeli’s work on p. 109:

“Other related work includes Saeli (2011), who suggests a methodology for quantitatively evaluating the effectiveness of defined contribution plans in the public sector by looking at a number of factors including employee participation rates, average contributions, periodic review of managers and service quality and fees.”

Here some of the metrics to include in a DC-specific governance study could be expanded to cover some of the unique qualities of DC plans, such as opt-in rates given the voluntary nature of DC plans, but the essential governance framework we lay out is

universal. After all, the methods we applied here to public pension plans were not invented in this study, but were cross-applied from the corporate governance world.

Question 12 - *You argue (pp. 13-14) that most corporate plans have shifted funding and investment burdens to workers because of increased foreign competition. Thomas Piketty and others have argued that the capital share of income has risen (and the labor share has fallen) significantly since 1980. In addition, many have shown that the income distribution has become significantly more unequal since the 1980s, while executive compensation has also sky-rocketed. Why should we think that increased foreign competition should be seen as the explanation for the decreasingly generous in corporate plans? (John Davis)*

It is true that capital share of income has risen and labor's has fallen. It is also true that income distribution is less equal today than it was forty years ago, but there is some further context around these statistics, which I will cover below. The main factor for the U.S. economy has been the deindustrialization that occurred over this time, and the transformation of the U.S. economy to a service and information-based economy. That process of deindustrialization has come about as industrial production has moved beyond U.S. borders to places in the world with lower labor costs. The upside of these shifts in the global economy is that global wealth has expanded at an unbelievable pace, and now many more people around the world are becoming ever closer (if not already there) to sharing the same standard of living we have enjoyed in this country for decades.

A former professor of mine at Iowa (now at Illinois), Deirdre McCloskey, just published a book entitled, *Bourgeois Equality: How Ideas, Not Capital or Institutions, Enriched the World*. In a recent essay that appeared in the *Wall Street Journal*, here is what she had to say about income inequality:

“Today’s concerns over the stagnation of real wages in the U.S. and other developed economies are overblown if put in historical perspective. As the economists Donald Boudreaux and Mark Perry have argued in these pages,

the official figures don't take account of the real benefits of our astonishing material progress."¹⁵⁴

A recent Op/Ed that also appeared in the *Wall Street Journal*, "Congrat's, You're a Billionaire." (Nov. 8, 2016) by Andy Kessler, underscored this point well in talking about smart phone technology, a device now in the hands of more than 2 billion people.¹⁵⁵

"It's a lesson easily forgotten because progress is a creeping thing. Society doesn't get wealthy overnight. But it does get wealthy. Three years ago, in his speech calling income inequality "the defining challenge of our time," President Obama lamented people's frustrations. "It's rooted in the nagging sense that no matter how hard they work, the deck is stacked against them. And it's rooted in the fear that their kids won't be better off than they were." To coin a phrase, the only thing we have to fear are those peddling fear itself. Won't be better off? Our kids are billionaires compared with us."

He argues that innovation has put into the hands of everyday people technology that couldn't have been acquired by those with endless financial resources even just a few years ago. How do we put a value on that, and still talk about income today? This question has some similarity to the usefulness of GDP as a measure of a country's wealth. Is it the dollar value of goods and services each nation produces, or should it be the utility of that production in promoting the quality of human life on which we should place a value?

Indeed, we have externalized the benefits of human innovation, without properly measuring them, just as we have externalized the costs of using certain scarce resources like water. Externalization to my mind is one of the biggest problems in economics today.

¹⁵⁴ <http://www.wsj.com/articles/why-the-west-and-the-rest-got-rich-1463754427>

¹⁵⁵ <https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/>

How can we, as a civilization, not properly value a scarce commodity like water, when two-thirds of the human population is living under significant water scarcity or drought, and the World Economic Forum has placed water security as one of the top three global challenges next to terrorism and climate change?¹⁵⁶

So, back to the original question: how did foreign competition effectively end the defined benefit plan (DB Plan) in the U.S.? It wasn't just deindustrialization that ended the DB plan, it was a host of factors, according to a 2014 report by the Bipartisan Policy Center:

“Employers with DB plans, however, face significant financial burdens. If contributions and investment returns are not enough to pay promised benefits, the employer is responsible for making up the difference. While DB plans are still the most common type of retirement plan among public-sector employees, these burdens help explain why DB pensions have become increasingly rare among private-sector employers over the past 30 years...This trend reflects a number of factors, including increased regulatory requirements aimed at ensuring that plans are adequately funded; employer attempts to reduce the volatility and cost of providing retirement benefits – employer contributions to DC plans are typically much lower; and the perspective that DC plans may be better suited for a modern, mobile workforce.”¹⁵⁷

Added to that list is the significant increase in human longevity and changing demographics, points I make in the dissertation, which have added incalculable costs to these plans. Many of these original plans were conceived when people only lived a few years

¹⁵⁶ <http://www.tfreview.com/news/risk/water-security-and-international-conflict-key-risks-say-pre-davos-wef-global-risks-2015-re>

¹⁵⁷ <http://bipartisanpolicy.org/blog/defined-benefit-plans-whered-they-go/>

into retirement, and there were many more workers to retirees. Now people can expect to live 20 to 30 years into retirement, and this has actuarially expanded the cost to sustain these programs in a way I am not sure anyone has precisely measured other than on a case-by-case basis. In addition, the worker-to-retiree ratio is plummeting across the developed world, which makes many pay-as-you-go plans, like Social Security, untenable at current benefit payment rates.

The chronic underfunding and widely unrealistic target returns (discount rates) on which public plans are valuing their liabilities (which grotesquely understates the current extent of their underfunding) today is further evidence that these forms of pension systems are most likely unsustainable in today's world at least under current approaches to their governance, management and funding.